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HENRY FAIRFIELD OSBORN

President of the Second International Congress of Eugenics. Photograph taken in Stockholm, on President Osborn's sixty-fourth birthday, August 8, 1921, while visiting Scandinavia on behalf of the Second International Congress of Eugenics

EUGENICS IN RACE AND STATE

VOLUME II

SCIENTIFIC PAPERS OF THE

SECOND INTERNATIONAL CONGRESS OF EUGENICS

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PREFACE

Since the World War there has come to be a greater interest than ever before in the matter of race and peoples. Perhaps President Wilson's phrase "self determination of peoples" helped bring to the front the question of the essential nature of race and the difference between races. Clearly the race problem has intimate relations with genetics, since biological race distinctions are hereditary traits. It has relations also with society, since many races are differentiated by peculiar instincts which lead them to react differently; and, since it is a human trait to demand conformity and similarity of action and ideals, very different races living in contact are apt to clash. This matter is of interest in considering immigration. Of genetical import also are the results of intermingling of dissimilar races. The differential increment of races in any country or in the world, by fecundity and deaths, is of much social importance. Finally there are many other applications of eugenical principles to the state which deserve discussion.

Races are differentiated on the physical side by the methods of anthropometry. Accordingly, some stress is laid upon that subject in this book by Bean, Baldwin, Giuffrida-Ruggeri, and Frassetto. Race mixture is considered philosophically by the Count de Lapouge. Weighty contributions to the subject are made by Mjøen, McDougall, Hooton, Vicari, Dublin, Hoffman, Dunn, Fishberg and Salaman. Particular races—Hawaiians, Slavs, Jews and Negroes—are described. This section of the Congress resolved itself into a veritable scientific race-congress.

A series of papers on eugenics applied to state problems is introduced by Major Darwin's masterly discussion of "The Field of Eugenic Reform." First are considered problems of population by Mallet, Pearl, and East, then selective elimination by Holmes and Goff, then marriage and parenthood, and eugenical sterilization by various investigators. The eugenical factor in relation to disease is discussed in eight papers, in relation to education in five others; in relation to immigration in two others. Finally the social and governmental relations of eugenics are stressed and at the close, as at the beginning of the series of papers of the Congress, a call is made for further research. Indeed the keynote of the two volumes of the International Eugenics Congress is the need of further research, and this is emphasized by the content and the spirit of over a hundred contributions to a field whose scope ever widens as it is explored, and the social bearings of whose discoveries are ever revealed as of the utmost social significance.

CHARLES B. DAVENPORT,
Chairman of the Committee on Publication.

LA RACE CHEZ LES POPULATIONS MÉLANGÉES

G. V. DE LAPOUGE

Bibliothécare, Poiters, France

C'est assurément à ma qualité d'ancêtre, le dernier survivant des fondateurs de notre science, que je dois le grand honneur de vous adresser aujourd'hui la parole, car depuis quinze ans je n'ai rien publié qui puisse vous intéresser, et je ne reprendrai mes publications que dans quelque temps. J'ai délaissé l'anthroposociologie pour consacrer tous les loisirs que me laissent mes devoirs professionnels à la recherche des lois de la variation, et surtout de la covariation chez un groupe d'invertébrés, la tribu des *Carabini*, dont j'ai pu étudier plusieurs centaines de mille individus.

Cette recherche n'était cependant pas étrangère à mes études habituelles, car elle avait pour but de former, d'après des faits concrets, mon opinion personnelle sur la nature de la race, sur l'éffet des croisements sur des populations animales à l'état sauvage, sur les covariations d'espèces parallèles, et, cas extrême sur les espèces morphologiquement indivisibles, mais dérivées par de telles covariations d'espèces multiples morphologiquement différentes. Ces cas sont précisément ceux que nous rencontrons chez les populations humaines. Les résultats de mes recherches paraîtront l'an prochain, et c'est alors seulement que je pourrai me remettre à l'anthroposociologie. En tout il faut de l'ordre et de la méthode, j'ajouterai de la patience.

Je ne vous apporterai donc point de faits nouveaux d'analyse ethnique, bien que j'aie encore à publier les mensurations de plus de vingt mille hommes, presque tous de Bretagne. Je me bornerai à résumer, et c'est déjà une tâche difficile, les données générales que nous ne devons jamais perdre de vue sur la nature et le rôle de la race chez les populations humaines. La race est caractérisée par la transmission héréditaire de caractères de valeur inférieure à ceux qui constitueraient une espèce. La notion de race est donc d'ordre zoologique, de la même nature que l'espèce et seulement de degré inférieur.

C'est par un vice de langage, qui a causé les plus grands maux à l'humanité que le nom de race a été donné aussi à des groupements humains caractérisés par une certaine communauté de langues, de religions et de coutumes.

On change de religion, de langue et d'habits, mais on ne change ni de crânes, ni de peau, ni de caractère. On a construit cependant toute une ethnographie de convention qui a dressé les uns contre les autres des hommes de même sang, et les linguistes qui ont découpé la carte du monde en compartiments d'après les dialectes parlés ont sans le vouloir, sans le savoir, donné une âme aux mouvements nationalistes dont la guerre universelle a été l'aboutissant. Il n'y a pas de races latines, de races germaniques ni de races slaves, mais seulement des peoples formés d'éléments de races anthropologiques, les mêmes mais diversement combinés, peuples que parlent des langues, professent des religions et des coutumes sans rapport nécessaire avec les races anthropologiques, mais plutôt avec les accidents de l'histoire. Je défie les fabricants de frontières d'en établir jamais d'après le données anthropologiques, ils seraient bien en peine pour planter leurs bornes sur le terrain. Depuis des millions d'années qu'il y a des hommes et des femmes ils et elles ont trop bien travaillé à rendre la chose impossible.

Si l'anthroposociologie n'avait pas été une science ignorée, et si dans les actions humaines le passionnel du caractère ne l'emportait pas toujours sur le rationnel de l'intelligence, il y a vingt millions d'hommes qui pourrissent et qui probablement seraient encore en vie.

Il n' y a pas de peuple qui puisse se vanter d'être de race pure. Depuis des millions d'années que les migrations, de voyageurs isolés ou de peuples colonisateurs, le commerce des esclaves, à la fois porteurs et marchandises, la fortune de la mer, jetant des naufragés sur des terres lointaines, brassent sans cesse les populations les plus diverses du globe, toutes les combinaisons les plus singulières se sont faites, et parmi les millions d'ancêtres de chacun de nous, les éléments les plus étrangers, les plus inattendus, trouvent leur place à coté des ascendants indiqués par la patrie et le milieu social de chacun.

La moindre réflexion suffit pour écarter l'idée d'un peuple de race pure, et même d'une population un peu étendue dont la race soit pratiquement pure.

Cette complexité des mélanges chez les populations humaines et la dislocation des caractéres qui se manifeste chez la plupart des individus des populations les plus civilisées ont induit beaucoup de personnes étrangères à la biologie à dire qu'il n'y a pas de races humaines, et à considérer la race comme un préjugé. Cette manière de voir est en quelque sorte officielle en France, et quand on croit à la race, à la différence mentale des races, à la valeur inégale des races, on est sûr d'avoir contre soi les pouvoirs publics, l'opinion publique, et encore plus celle des hauts personnages de

la science officielle grandes écoles et universités. Cette manière de voir n'est d'ailleurs pas propre à la France, je la retrouve chez tous les peuples où dominent les races inférieures.

C'est une erreur que je tiens particulièrement à réfuter, car si elle était acceptée, elle aboutirait à faire regarder comme superflues toutes les recherches sur les races anthropologiques, la psychologie des races et l'anthroposociologie. En fait toutes ces branches de la connaissances sont exclues en France de l'enseignement des Universités, pour des raisons d'ordre politique. On admet depuis Jean Jacques Rousseau qu' entre les hommes toute la différence vient de l'éducation, et rien de la naissance.

On dit qu'il n'y a pas de races chez l'homme à cause des mélanges qui existent chez les peuples et même chez les individus, c'est aussi absurde que de nier la race chez les animaux. Ce mélange n'est aucunement une chose propre à l'homme. Il n'y a pas de population animale de race pure, non seulement chez les animaux domestiques, mais presque au même degré chez les animaux sauvages. Il n'y a d'exception, et encore que pour les races animales entretenues par l'homme et longuement sélectionnées, jusqu'a disparition de tout atavisme. Et en entendant parler de disparition de tout atavisme, ceux qui ont la pratique des élevages ne peuvent s'empêcher de sourire.

On ne s'étonne pas que le boeuf d'Indo-Chine, par exemple, résulte de la combinaison de trois espèces au moins appartenant à deux sous-genres, parce que la reproduction du bétail est réglée par la volonté de l'homme. On apprendra au contraire avec étonnement que partout où des courants de migration, souvent d'époque géologique différente, ont amené dans un même pays des races distinctes par leur morphologie et leur origine géographique, la même incohérence existe, jusque dans l'individu, que chez la population humaine du nord de la France ou de l'Allemagne centrale. C'est le cas par exemple du Mesocarabus problematicus dans la montagne Noire, Oude. Il y a d'ailleurs aussi autre chose, qui existe peutêtre chez l'homme et mérite d'éveiller l'attention des anthropologistes, c'est le cas d'espèces ou de races de premier ordre, convergeant morphologiquement et géographiquement vers une espèce ou race à peu près uniforme, polygène. C'est le cas par exemple, du *Mego dontus violaceus* de l'Allemagne du Nord, produit complexe de l' *aurochalceus* des Asturies, du *purpuraceus* du Harz, du *britannicus* d'Angleterre, du *picenus* des Abruzzes, du *germari* de Croatie, du *silvensis* des Balkans, de l'*aurolimbatus* du Caucase, formes datant du tertiaire moyen, et qui ont réalisé, après plusieurs millions de générations, des descendances identiques.

Un tel cas n'autorise aucunement à prévoir que dans l'avenir toutes les races humaines se fondront en une forme unique, identique sur toute la terre. Je me hâte de le dire pour arrêter l'élan des philanthropes trop imaginatifs. Le mélange des races chez mes carabes ne s'est fait qu'après l'évolution de chacune d'elles en formes ultimes identiques.

Le cas n'a été possible que sous deux influences, l'existence chez tous ces *Megodontus* de tendances identiques, d'une potentialité identique d'évolution, et d'un milieu final identique. Le milieu ne sera jamais identique sur la terre, les potentialités des races humaines ne sont pas parallèles. On peut se demander seulement si toutes les races humaines définies sont bien d'origine monogénique, ce qui compliquerait encore les problèmes de l'anthroposociologie.

Je reviens à mes populations mélangées. Ce qui fait que les observateurs superficiels n'y voient plus de races, c'est qu'ils parlent de la notion de race fabriquée par sélection systématique, dont les individus finissent par être presque tous semblables. Dans la nature, et spécialement chez les peuples mélangés il ne peut en effet rien exister de tel, par définition même. La race subsiste cependant, et par les méthodes d'analyse ethnique, on peut déterminer la proportion de sang de chaque race définie dans une population mélangée. Analyse, parce que nous sommes en présence de phénomène dont l'allure rappelle beaucoup celle de la chimie. Les caractères morphologiques se dissocient et se combinent diversement chez les métis, d'après des lois qui sont pour partie celles de Mendel, pour partie d'autres plus compliquées, mais dans chaque individu il reste une certaine proportion de caractères de races premières, les exceptions peuvent se réduire aux suivantes.

1. Le cas, très rare, où il s'est constitué une race seconde paraissant fixée, dont les caractères ne sont plus à regarder comme appartenant aux races premières, mais comme devenus propres à la fois à une race première et à la race seconde.

2. Celui, très fréquent quand le sang d'une race est très abondant, où cette race reparaît en nombre dans la plénitude de ses caractères, par exemple *H. europeus* dans l'Europe du Nord et l'Amérique du Nord.

Ce retour de la race dominante est en relation avec la loi de Mendel, mais aussi avec un phénomène très important, l'élimination de certaines ascendances. Le nombre théoriquement presque infini des combinaisons de caractères ne se réalise pas en pratique. Pour des raisons que nous ignorons, le nombre des combinaisons réalisables chez une population mélangée est assez limité, exactement comme en chimie le nombre des carbonates, des azotates et des sulfates. Pour ces causes que nous ignorons,

les unes probablement liées au mécanisme de la caryokinése, les autres à l'action du milien, certaines hérédités sont très promptement éteintes. Ainsi dans la région que j'habite et que j'ai très étudiée, Poitou, Aunis, Bretagne, pays à grandes relations avec les Antilles et la Réunion, beaucoup de familles dont une partie était aux Iles ont introduit des nègres et des mulâtresses, plusieurs dixaines de mille, et cependant on ne trouve, à part quelques chevelures crépues d'origine douteuse, aucune trace de ces esclaves ou enfants d'esclaves.

La proportion des races dans une population varie sans cesse. J'ai montré il y a plus de trente ans que cette variation était due au jeu des sélections sociales et non aux conquêtes et aux immigrations comme on le pensait autrefois. C'est ainsi qu'en Grèce il ne reste plus guère de descendants des anciens Hellènes, dont le type était à peu près identique à celui des grands dolichocéphales blonds de Suède et d'Ecosse. De même en France la population actuelle, où domine l'*H. alpinus*, n'a aucunement la composition de celle de l'époque du cuivre, où dominait l'*H. contractus*, encore abondant cependant dans l'ouest, ni du haut Moyen Age, où dominait l'*H. Europeus*, dont la descendance achève de s'éteindre.

D'une manière uniforme, les sélections sociales tendent à substituer aux races supérieures, riches en eugéniques, les races inférieures. Les premiers, dont les bésoins économiques sont plus grands, ne peuvent pas élever de nombreux enfants, parce qu'ils coûtent trop cher à instruire et à établir; les races inférieures dont la postérité ne demande que quelques années de nourriture et de vêtement, et qui bénéficient en outre de l'assistance des autres, peuvent se permettre une descendance nombreuse.

En France, la guerre a porté aux éléments supérieurs un coup qui peut être mortel. Les meilleurs de nos jeunes gens ont péri ou sont revenus invalides, dans la proportion d'au moins 2 sur 3, si j'en juge par nos étudiants et par les familles aristocratiques de mon entourage. Beaucoup de celles-ci vont s'éteindre, le dernier mâle ayant été tué. Dans les mêmes milieux les filles ne trouvent pas à se marier, parce que les garçons ont disparu en partie et parce que la cherté de la vie fait que leurs dots sont trop petites pour pouvoir, jointes aux gains d'un mari, fournir les ressources suffisantes pour fonder une famille. Il faut savoir que chez nous les salaires réels des intellectuels sont inférieurs à ceux des ouvriers. Si l'on fait la somme des salaires de l'existence entière en déduisant les frais d'études et d'entretien jusqu'au premier salaire, cette infériorité se voit avec évidence.

J'ai lieu de croire que ces résultats désastreux, de la sélection exercée par la dernière guerre sont les mêmes chez tous les autres peuples de l'Europe. Pour la Russie, le patrimoine eugénique peut être considéré comme détruit.

Nous assistons à une crise des races supérieures et des eugéniques, menacées de disparaître au moment où il faudrait une abondance de surhommes.

Le temps n'est plus où la terre fournissait aisément le nécessaire. Dans quelques siècles, il n'y aura plus ni métaux, ni charbon, ni pétrole, ni des aliments suffisants pour la population du globe. Dans la vie sociale, les problèmes à résoudre par l'homme d'état, le chef d'industrie, de commerce ou de banque deviennent d'une complexité qui dépasse les limites de la mentalité présente. Demain vous ne trouverez plus un homme qui soit à la hauteur de certaines tâches nouvelles, et j'ose dire que les meilleurs d'aujourd'hui se sont bien mal tirés des difficultés présentes.

La masse des connaissances déborde l'entendement. Le temps n'est plus où tout s'expliquait par l'atome immuable et indivisible, la cellule et la Karyokinèse, le transformisme, la gravitation et la géométrie euclidienne. La science est au bord des infinis, et les plus robustes cerveaux faiblissent devant les tâches entrevues. Il faut forger des mémoires plus vastes et des perspicacités plus aigües.

L'heure est venue où l'homme doit choisir s'il deviendra un demi-dieu, ou s'il retournera à la barbarie des contemporains du mammouth. Et ce n'est pas une figure de rhétorique que de parler de retour possible à la barbarie. Les classes les moins douées, le résidu des incivilisables sur la terre entière reprochent aux élites d'avoir crée une civilisation qui multiplie leurs désirs bien au delà des possibilités de les satisfaire. Un mouvement immense se fait dans les races et les classes inférieures, et ce mouvement qui a l'ain d'être tourné contre les blancs, contre les riches, est tourné contre les éléments intellectuellement supérieurs et contre la civilisation elle même. La guerre des classes est la vraie guerre de races.

Dans ma leçon du 24 février 1887 (*Revue d'Anthropologie*, 1887, p. 549), je disais ceci: "L'organisation d'une sélection artificielle n'est qu'une question de temps. Il sera possible de renouveler en bloc, en quelques siècles, toute l'humanité, et de remplacer la masse par une masse bien supérieure, dans laquelle la sélection pourra être ultérieurement continuée. J'ai confiance dans les Anglo-Saxons pour mener à bien cette entreprise sans pareille et faire passer dans la pratique une théorie dont ils ont eu jusqu'ici le monopole." Alors j'étais seul dans ma chaire de l'Université de Montpellier. Aujourd'hui j'ai passé l'Océan pour me joindre à vous, et vous êtes une foule autour de moi.

Américains, il dépend de vous, je l'affirme fortement, de sauver la civilisation et de faire sortir de vous un peuple de demi-dieux.

NOTES ON THE BODY FORM OF MAN

R. BENNETT BEAN

Anatomical Laboratory, University of Virginia

This paper deals chiefly with stature and sitting height.

MATERIALS

The materials include measurements by the author of 6219 men, women and children, American whites and negroes, and Filipinos; records of other authors representing about 45,000 persons, from 396 groups of peoples throughout the world. Two other groups have been reported by Giuffrida-Ruggeri numbering 44,929 Swedes and 119,571 Spaniards.

OUTLINE

1. Sitting height throughout the world.
2. Standards for stature, sitting height and sitting height index.
3. The morphologic index.
4. American whites and negroes, and Filipinos.
5. The growth of sitting height.
6. The relation of sitting height to type.

1. Sitting height throughout the world

The median sitting height of five divisions of man, Asia, America, Africa, Europe and the Pacific Islands is given in table 1. By the median is meant that number which has grouped about it an equal number of racial averages above and below. The median stature and the median sitting height in relation to stature, or sitting height index, are also given in table 1 for the five divisions of man.

Males. Europe has the greatest sitting height, the Pacific Islands the least, America and Asia are next to Europe and Africa next to the Pacific Islands. Africa has the tallest stature, the Pacific Islands the smallest, Europe is next to Africa, and America and Asia close to the Pacific Islands. America has the greatest sitting height index, Africa the least, Europe and Asia are close to America and the Pacific Islands close to Africa.

Females. The females are similar to the males.

The sitting height index is low for Asia because of the inclusion of East Indians that make up more than two-thirds of the number. The index of America is high because of the inclusion of Central Americans that make up nearly three-fourths of the number. The index of Africa is higher than that of the true negro, because the records are of Africans with a large admixture of European blood. The Europeans do not include the Swedes and Spaniards of Giuffrida-Ruggeri whose index is 52.9 for the Swedes and 52.1 for the Spaniards. The negro influence is seen in the Pacific where the Australian index is the lowest in the world.

TABLE 1

Median of racial averages

	MALE			FEMALE		
	Stature	Sitting height	Sitting height index	Stature	Sitting height	Sitting height index
Asia	163.2	85.2	52.3	151.6	80.7	52.8
America	163.5	86.3	53.0	154.5	81.5	52.6
Europe	166.6	88.2	52.9	156.5	83.5	53.3
Africa	167.5	84.3	50.5	149.0	77.5	50.7
Pacific	160.5	82.6	51.5	148.5	76.7	51.3
Total	163.7	84.5	52.2	152.4	80.5	52.4

2. Standards for stature, sitting height and sitting height index

In any study of the peoples of the earth it may be well to bear in mind that there are four great masses, Asiatic, American, African and European, and that these represent the fundamental stocks which carry evolution. Other peoples, such as Eskimos, Australians, Malays, Negritos, Pigmies, etc., apparently represent modifications through mixture, blend, mosaic and isolation who have undergone great changes from the fundamental stocks; and are mere remnants, the survivals under adverse conditions in different environments.

The averages for the four great continental masses of peoples are given in table 2. An effort is made to leave out the fringes and take only records from centrally located masses. This is easy to do for Asia, and means more than for the other continents, because the Chinese are centrally located and have been fairly stable in their present location. Africa, however, is a continent of continually recurring movements of peoples largely from Europe and western Asia, and the heart of the continent has not been explored nor have the natives of the far interior been measured to any extent.

Europe has also had its interminable interminglings of peoples, but America is somewhat like Asia, although movements have been common and the people are relatively recent entrants.

The modal stature of the four great continental masses of peoples is represented by that of Europe and Asia, 165 centimeters for males, with North America slightly higher, Africa much higher and Central America much lower. The records from Africa are not the true negroes but are mixed American, Bantu, Nilotic, Nigerian, etc., and the records from Central America are Indians mixed with the Spanish. The sitting height index of the true negro is better represented by nine groups of Central Africans with indices varying from 47.9 to 49.6. The modal stature for females is taken as about 155 cm.

TABLE 2

Averages for the four great masses of man

	STATURE	SITTING HEIGHT	SITTING HEIGHT INDEX	NUMBER
Male				
Asia	165.0	88.0	53.5	1,267
America	168.0	88.0	52.3	1,050
Africa	172.0	85.0	49.5	3,500
Europe	165.0	87.0	52.5	165,000
Central America	157.6	82.7	52.4	2,476
Female				
America	157.0	82.0	52.6	500
Africa	162.0	80.0	49.4	100
Europe	155.0	83.0	53.5	1,500

The modal standard sitting height for Europe, Asia and North America is above 85 cm., and for Africa, Central America and the Pacific it is 85 cm. or less for the males. It is about 80 for the females.

The modal sitting height index of Europe and America is about 52.5, of Asia 53.5, and of Africa 48.0 to 50.0. The sitting height index of the true negro is better represented by that of nine groups from Central Africa with indices varying from 47.9 to 49.6.

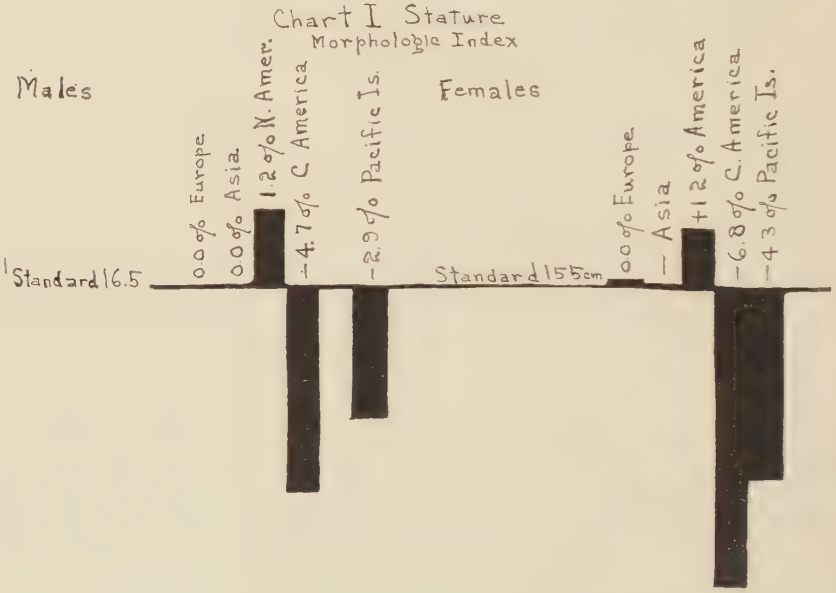
The normal standards here adopted are:

For males. Stature, 165.0 cm., sitting height, 85 cm., sitting height index, 52.5.

For females. Stature, 155.0 cm., sitting height, 80 cm., sitting height index, 53.5.

3. The morphologic index

The morphologic index is a number which represents the percentage difference between racial means and a standard taken as a basis for computing the percentage difference. This standard should be as near the average of the four great masses of peoples as it is possible to reach with our present knowledge. It may ultimately have to be revised and it may change in the course of time. The morphologic index may be used with any factor, either actual measurements or indices.



Take the standards established for stature, sitting height and sitting height index, and calculate the morphologic index in different groups of peoples based upon table 2, and we may visualize the result as shown in charts I, II, and III.

The most distinctive characteristic of the morphologic index for stature is the low index for Central America and the Pacific.

For sitting height the morphologic index is high for Europe, Asia, and North America, and low for Central America.

The morphologic index for the sitting height index is high for Asia and extremely low for Africa.

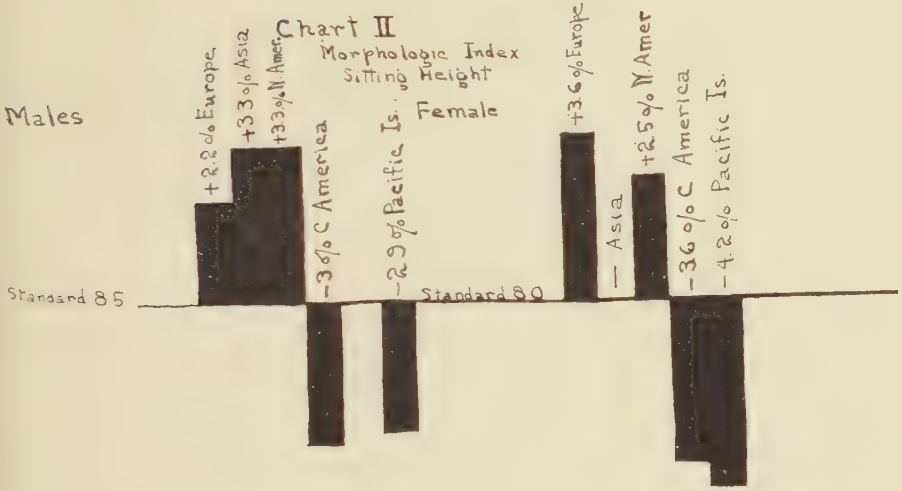


Chart II
Morphologic Index
Sitting Height
Males
Female
+2.2% Europe
+33% Asia
+33% N. Amer.
-3.6% C America
-2.9% Pacific Is.
Standard 85
Standard 80
+3.6% Europe
— Asia
+2.5% N. Amer
-3.6% C America
-4.2% Pacific Is.

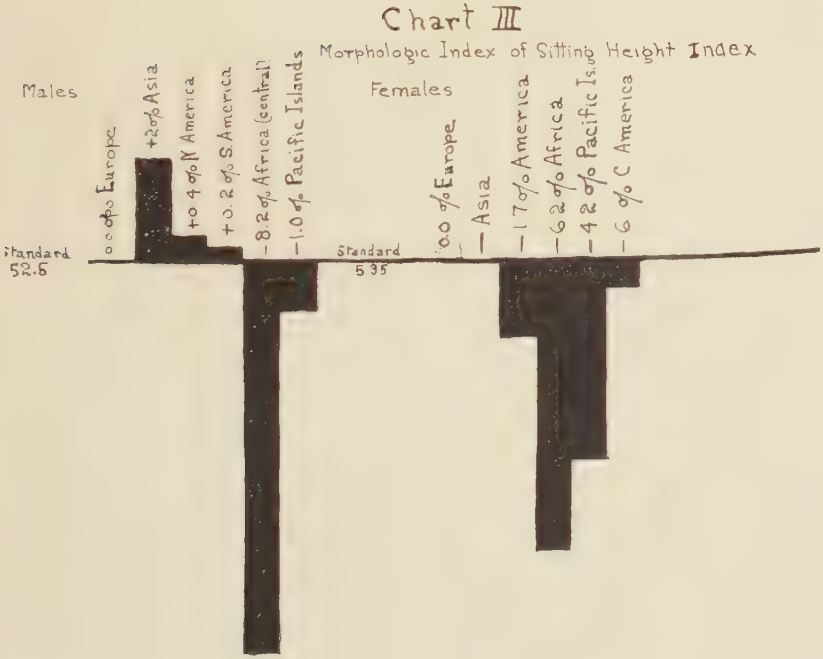


Chart III
Morphologic Index of Sitting Height Index
Males
Females
0.0% Europe
+2.0% Asia
+0.4% N America
+0.2% S. America
-8.2% Africa (central)
-1.0% Pacific Islands
Standard 52.5
Standard 53.5
-0.0% Europe
— Asia
-1.7% America
-6.2% Africa
-4.2% Pacific Is.
-6% C America

When we examine the sitting height index for outlying groups we find, as illustrated in table 3, the lowest index among the Australians and the highest among the Eskimos. Closely related to the Australians are the Negroes, Negritos, Melanesians, and East Indians; and closely related to the Eskimos are the Siberians, Chinese, Ainos, and Pigmies of Africa. A low index relates to the negroes except in the case of the Pigmies, and a high index to peoples of low stature who live under adverse conditions.

The tropical forest peoples, especially the Pigmies of Africa and the Indians of the Amazon basin, have not only the handicaps of luxuriant vegetation,—which prevents agriculture,—few domestic animals, tough

TABLE 3

Sitting height index of selected groups

	MALE		FEMALE	
Europe	8,499	52.4	1,346	53.1
Negroes	3,884	49.9	185	50.3
Chinese	1,429	53.6	25	53.0
South America	2,812	52.4	756	53.2
North America	1,398	52.0	494	52.1
Malays	1,417	52.1	125	52.0
Negritos	378	50.9	10	49.8
Melanesians	200	50.0	10	51.3
Australians	40	45.5	10	47.9
Pigmies, African	49	53.7	16	52.9
Aino	90	52.8	71	53.6
Eskimo	94	53.7	74	54.6
Siberians	1,417	53.5	72	53.5
India	598	51.6		52.9
Other Asiatics	158	52.4	46	52.4

grass, insect pests, rusts, blights, and bacterial infections, but to these must be added the natural aversion to labor and lack of energy of a tropical climate. The "frozen desert" people of the north, Eskimos, Siberians, Lapps, etc., labor under the disadvantages of slight rainfall, scanty vegetation, practically no agriculture, few animals, and a sparse population. The result is a stunted growth which through selection has become more or less fixed. The extreme forms of this stunted type are found in tropical forest and frozen desert, but other peoples adjacent to them are similar in type and among all peoples sporadic cases occur, and variants that approach that type. On the other hand are people who are the direct reverse, and between the two may be found several intergrades. Thus follows naturally a classification of individuals from the standpoint of type.

4. American whites and negroes, and Filipinos

The stature of the American whites and negroes is about the same, but that of the Filipinos is 10 cm. less. The sitting height of the three groups is different, the negroes nearer the Filipinos than to the whites. The sitting height index is the same for the whites and Filipinos but it is lower for the negroes. The negroes are hybrid Afro-Americans with a preponderance of white blood. The Filipinos are from all parts of the Philippines, with considerable Negrito blood but with a larger proportion of Chinese and European. The Chinese and Negrito neutralize each other because the former has a high sitting height index and the latter a low one, therefore the index is the same as for the European or white. This may be seen in table 4.

TABLE 4

American whites, American negroes and Filipinos

	STATURE	SITTING HEIGHT	SITTING HEIGHT INDEX	NUMBER
Males				
Whites	173.8	90.8	52.3	2,066
Negroes	171.3	87.0	50.8	1,271
Filipinos	161.2	84.5	52.4	598
Females				
Filipinos	147.8	78.4	53.1	63

5. The growth of the sitting height

From table 5 we may note that the sitting height index is lowest in girls between the ages of twelve and fourteen years, and in boys between the ages of fourteen and sixteen years. This is the period when the lower extremities are ceasing to grow rapidly and the torso or bust is beginning to grow rapidly.

The bust of the girls is absolutely longer than that of the boys between the ages of ten and fifteen years. The period of most rapid growth in sitting height in girls is from eleven to thirteen years, and in boys from fourteen to sixteen years. The girls are precocious and the boys retarded.

The Asiatic seems to have a short youth and a long adolescence, because the lower extremities are retarded early in their growth, and the bust is accelerated early and retarded late in its growth. The adult Asiatic has a long torso and short lower extremities. The African seems to have a long youth and a short adolescence, because the lower extremities grow to a

FIGURE 1

Left. Negrito of the hyperphylomorph type with long legs.
Center. Mixed negrito of the mesophylomorph type with medium legs.
Right. Negrito of the hypophylomorph type with short legs.

late age and the rapid growth of the sitting height is late and short. The adult African has a short torso and long lower extremities.

The European is intermediate between the Asiatic and African in the growth of both the torso and lower extremities. This varies with the type.

It may not be out of place to say a few words about the torso of the negro. The sinuosities of the vertebral column in the negro have been observed for

TABLE 5

The sitting height index by age; males

AGE	WHITE			NEGRO		FILIPINO		CHINA	
	Bean	Hastings	Weissenberg	McDowell	Suk	Bean	Bobbitt	Bobbitt	Pyle
5	54.3	56.1	57.1		54.4				
6	53.5	55.6	56.0	55.0	54.4				
7	53.0	55.3	55.3	54.0	52.2	53.3	54.4		
8	52.7	54.3	54.9	53.3	53.0		55.6		
9	52.0	53.9	53.9	53.3	52.0		54.6	54.9	
10	51.1	53.4	53.6	52.2	52.0		53.6	55.2	
11	51.4	53.0	52.4	51.7	50.7	51.8	53.9	54.4	53.6
12	51.2	52.3	51.9	52.7	50.3		53.0	54.1	53.0
13	51.2	51.8	51.9	50.9	50.1	51.2	52.9	54.0	53.7
14	50.8	51.7	51.4	50.6	49.7	**50.5**	**52.4**	**52.8**	**52.8**
15	**50.5**	**51.6**	**51.0**	50.8	49.6	50.8	52.6	53.2	53.3
16	50.7	52.1	51.5	**49.7**	50.0	51.5	53.2	52.1	53.8
17	51.3	51.5	52.2	50.8	51.0	51.6	52.8		
18		52.3	52.5	51.2	**49.3**	51.8	53.4		
19		52.5	**52.6**	51.3	49.9	51.9	53.1		
20		52.7	52.5		49.9	51.5	53.7		
21						51.8			
22						51.8			
23						52.2			
								Legendre	Bean
Adult	52.3		52.6		49.9	52.4		53.6	53.5

many years by me in the dissecting room. There is a marked convexity forward in the lumbar region and again in the cervical region, with compensatory convexities backward in the upper thorax and sacrum. The back cannot be straightened and the thorax and buttocks project backward and the head and abdomen forward when the negro is standing. The head can be brought into line with the thorax and buttocks behind only by elevating the chin and looking upward. This is only in the true negro. The legs of the negro are thrown back at the hips, the pelvis is tilted forward to bring

the body to the center of gravity, the spinalis musculature is contracted to pull back the trunk and thus maintain the erect posture. The lumbar curve is thereby increased. The abdominal muscles pull the upper ribs and sternum forward and downward because of their tension due to the tilting of the pelvis, the protrusion of the lumbar vertebrae into the abdomen, and the

FIGURE 2

Left. Negrito of the hyperphylomorph type with long legs.
Center. Negrito of the mesophylomorph type with medium legs.
Right. Negrito of the hypophylomorph type with short legs.

action of the spinalis musculature. The result is a shortened torso and relatively long legs. The great muscular development of the trunk in the negro may be explained in part by the same conditions; all due to the attempt on the part of the negro to maintain the erect posture

FIGURE 3

Left. Mangyan of Mindoro having negrito blood, of the hyperphylomorph type (modified) with long legs.

Center. Mangyan of Mindoro of the mesophylomorph type with medium legs. Resembles American Indian.

Right. Ilongot (Igorot) of Luzon of the Hypophylomorph type with short legs. Resembles Japanese.

6. *The relation of sitting height to type*

Differences due to race, as between negroes and other races especially, and differences due to selection through isolation and environment have

TABLE 6

Sitting height index in relation to type; males

		HYPOPHYLO-MORPH	MESOPHYLO-MORPH	HYPERPHYLO-MORPH
White	Stature	159.3	174.9	173.5
	Index	54.0	53.0	52.1
Negro	Stature	163.2	170.8	172.2
	Index	51.5	51.0	50.6
Filipino	Stature	159.8	161.3	161.7
	Index	52.7	52.2	52.1
Selected cases				
White	Stature	163.9	172.8	180.2
	Index	54.0	52.7	51.6
Negro	Stature	164.9	172.7	179.5
	Index	51.6	50.4	49.6
Stature below 170 cm.				
White	Stature	163.9	167.9	166.5
	Index	54.0	53.6	52.8
Negro	Stature	164.9	165.1	165.4
	Index	51.6	51.8	51.2
Filipino	Stature	159.8	167.9	162.2
	Index	52.7	53.4	51.8

Types subdivided

		SUB	INTER	SUPER	SUB	INTER	SUPER	SUB	INTER	SUPER
White	Index		54.0			53.0		52.9	52.2	52.1
Negro	Index		51.6		51.3	50.9	50.8	50.9	49.8	50.5
Filipino	Index	53.6	52.9	52.0		52.3		52.3	52.6	52.1

been given. There are also differences due to stature. The leg length varies directly with stature, as clearly shown by Pfitzner, therefore the sitting height index varies inversely with stature. This is true during

growth and in relation to small and tall races except for the negro. There are also sexual differences not only because the female is smaller than the male, but with those of the same stature provided they are also of the same type. We thus come to consider type differences. Table 6 gives some averages in different groups, of the sitting height index in relation to type where the stature is also known.

First, three groups are divided into the three types called Hypophylomorph, Mesophylomorph and Hyperphylomorph. The Hypophylomorph is like the Pigmy, the Eskimo, the Amazonian, or the Siberian. The Hyperphylomorph is like the Mediterranean or Nordic European. Between the two are the Mesophylomorphs. Central Europe, Central Asia and America typify these.

Selected cases are given to show some extreme conditions that may be found among the American whites and negroes, and Filipinos. Then are separated those below 170 cm. stature, and finally each of the three primary types are subdivided into three other types. The records are all males. The differences are readily seen, and, throughout, the negro is discernible by reason of the lower index. There are few except Hyperphylomorphs among the whites, few except meso- and hyper-phylomorphs among the negroes, but all varieties among the Filipinos due to their compound origin or multiple mixture.

The hyperphylomorph is precocious in the metamorphosis of the torso and extremities, as a result of which the sitting height index is less at all ages and statures. The other types are more retarded in metamorphosis, with the result that the adult condition is different.

Three types may be found among the people of any group, but any clear separation of individuals is difficult and more or less relative. The extreme cases are easily discerned, but the intermediate grades are more difficult to detect.

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THE SCIENTIFIC PREDICTION OF THE PHYSICAL GROWTH OF CHILDREN

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The development and practical applications of a science may be measured by the degree to which prediction is possible. The plotting and analysis of 1000 individual growth curves based on consecutive measurements on nude children for periods including from 18 to 24 semi-annual measurements has convinced me that we are for the first time in a position to approach scientifically the problem of physical growth from the standpoint of prediction.

A number of characteristics for specific physical traits are apparent from growth curves.[1] For example, the physical traits expressed as a function of age from six to seventeen show that for standing and for sitting height, the curves form a series of concentric arcs which are convex at the adolescent ages; for weight, breathing capacity and circumference of chest the curves are concave; and for strength of arms and back, aside from temporary fluctuations, the curves approach a straight line. Where weight is expressed as a function of height, the curves are concave, similar to the age-weight curves.

It is also evident that there are definite laws of growth for different types of children when classified on the basis of stature, sex, physiological age, parentage and nationality.

For growth in stature it may be noted from a general survey of the curves, for example, that the boys are, as a rule, taller than the girls, except from approximately eleven and a half to thirteen and a half years of age. The girls reach their maximum period of growth earlier than the boys. For both boys and girls the curves fan out as the age increases from four to eighteen years; an adolescent acceleration appears earlier for the girls than for the boys, preceded by a slight retardation; at the pubescent acceleration the curves approximate in appearance a series of concentric arcs with the acceleration appearing earlier in the upper arcs than in the lower. The

[1] For the original data on which this paper is based, see Baldwin, Bird T. The Physical Growth of Children from Birth to Maturity. University of Iowa Studies in Child Welfare. 1921, Vol. 1, No. 1, p. 411.

curves assume a railroad appearance. Each boy and girl holds his or her relative position in the group for the ages from four to eighteen years, with little crossing of the curves.

Correlations between physiological age and stature are apparent from many angles. The taller boys and girls are more mature physiologically at a given chronological age than shorter boys and girls, since they reach their periods of maximum growth and diminution of growth earlier. Another illustration may be cited. Early maturity is followed, as a rule, by a rapid cessation of growth in stature. For girls who mature at 11, when the annual increment is from 5 to 7 cm., the increment decreases to less than 1 cm. at 14.

For siblings the individual growth curves in stature show that one may be taller than the other, but the curves are strikingly similar in their appearance. A consideration of the parallel and concentric curves which give an index of physiological stages of growth shows that in two brothers the variation in height at any one physiological age is not more than 1.5 cm. from six to fourteen years of age.

There are marked variations among different nationalities in the relation of height to weight when expressed by the weight-height index, whether computed from the absolute height, the square of the height or the cube of the height.

In order to determine whether children maintain their relative position in growth of stature, for example, before and after pubescence, the coefficients of correlation (self correlations) between physical measurements at six years of age and six years later and at nine and ten years of age and six years later have been found for stature. The high correlations show there is a great probability that a boy or girl who is tall at six years of age will be a tall boy or girl at sixteen years of age. These correlations are for boys $+ 0.825$ with a P. E. of ± 0.036 and for girls $+ 0.807$ with a P. E. of ± 0.027 by the Pearsonian method, and by the rank method $+0.85$ and $+ 0.82$. Between 9 or 10 and 6 years later the coefficients are for boys $+ 0.944$ with a P. E. of ± 0.011 and for girls $+0.735$ with a P. E. of ± 0.032.

Growth in height from seven to seventeen years of age is more highly correlated with growth in weight, sitting height, breathing capacity, girth of chest and strength of right and left arms for boys than for girls. These results show that boys not only grow very differently from girls, but that their development is decidedly more highly correlated in its varied aspects. There is a biological difference between the growth of boys and girls during these ages from seven to seventeen.

The correlation coefficients give a new insight into the development of the human organism during the plastic period from childhood through adolescence. The coefficients for all traits are positive and attain their maximum during early adolescence and their minimum at seventeen years of age. The periods of irregular development for individual boys and girls are from seven to ten years of age and during later adolescence, with a decidedly less constant and unified development among the girls.

The partial correlations when worked out for each age show that growth in height for boys and girls has little effect on the growth of circumference of chest, but does materially affect growth in weight, sitting height and development of strength, especially for the girls.

When an absolute measure of variability, as the standard deviation in inches or centimeters, pounds or kilograms, is divided by the average, a relative measure is obtained which is called the coefficient of variation, which is a pure number whereas such as the standard deviation involves various units of measurement. In making comparisons of the groups with respect to this variability, allowance can be made for the fact that the amount of central tendency influences the size of the S.D. that is obtained.

The discovery of the variability of a species or a class of organisms lies at the basis of the evolution of the species or class and is the determinant in tracing the factors of natural selection and inherent growth of the individuals.

The coefficients of variability in height tabulated below for these same groups of children show that boys are more variable than girls.

	AGE 6	AGE 12	AT 9 OR 10	6 YEARS LATER
	per cent	*per cent*	*per cent*	*per cent*
Boys	4.41	6.16	5.89	5.56
Girls	3.92	4.30	4.39	3.82

Pearson found that male infants at birth are more variable in height and weight than females, but that from six to ten years of age females are more variable than males in both height and weight. For 120 children from seven to seventeen years of age, where repeated annual measurements have been made from six to ten years on each child, our results are contradictory to Pearson's for height at the years 7, 8, 9, 10, 11, 13, 14, 15 and 16 years of age, i.e., for height boys have a greater variability than girls at all ages between seven and seventeen, except at twelve and seventeen; at thirteen the variabilities are the same. The figures expressing variability in height in girls are more uniform than the coefficients of variability for the boys.

The maximum coefficient for boys after seven years of age is at fourteen years of age; the maximum for girls is at twelve years of age.

A significant problem in the growth of children is what per cent of final stature at seventeen years of age a child has reached at seven years of age and at twelve years of age. Do boys and girls grow more between seven and twelve years of age or between twelve and seventeen years of age? The per cent of final growth at seventeen years of age that has been attained at seven years of age is, on the average, 70.3 per cent for boys and 74.2 per cent for girls, and at twelve years of age 83.8 per cent for boys and 90.0 per cent for girls.

Using the formula $y = r \frac{\delta y}{\delta x} x$ (Yule, chapter. IX) for the regression equation, one can predict from the height at six years of age the height for individual cases at twelve years; and from the height at nine or ten, the height for fifteen or sixteen. The computation gives in the case of boys for prediction of height at 12, a maximum error of 11.91 cm., and in the case of girls a maximum error of 11 cm. For the prediction of height at ages fifteen or sixteen from height at nine or ten, the maximum error for boys is 6.09 cm. and for girls is 10.97 cm.[2]

The average of the differences between the predicted and the actual height at twelve when predicted at six is 3.48 cm. for boys, and 2.96 cm. for girls. The average difference between the predicted and the actual height at fifteen or sixteen and the measurements predicted from height at nine or ten is 2.63 cm. for boys, and 3.18 cm. for girls.

The P. E. of estimate on any individual case in these groups when the height of twelve-year-old boys is predicted from the height at age six was found to be 2.98 cm. and for the twelve-year-old girls 2.58 cm. For the prediction of height at ages of fifteen or sixteen from ages nine or ten the P. E. of estimate was found to be 2.09 cm. for the boys and 2.81 cm. for the girls. That is, the chances are even that any measurement predicted from the height at the age of nine or ten years for girls will lie within the limits of $\pm$ 2.81. In the case of the girls where the P. E. of estimate is $\pm$ 2.81 cm. the chances are one to 4.5 that a measurement will lie outside of two P. E. or $\pm$ 5.62 cm.; or the chances are 8,198 in 10,000 that the predicted measure will be within two P. E.

[2] In addition to working out the actual and predicted measurements for height at different ages, as illustrated by a few samples in this paper, the writer and one of his assistants, Gladys M. Fairbanks, A.M., are finding the P. E. of estimate for 19 additional physical traits for the various ages of boys and girls.

The predicted height enables one to determine whether children are advancing at a normal rate and to take growth stimulating measures if the children are not up to standard.

If the predicted height is not reached, investigation into the pathological, nutritional, climatic and environmental conditions affecting growth can be made and remedial measures applied to other children.

The significance of any particular period of growth depends on what the ultimate stature of the individual should be. For example, the normal increment of growth between six and seven years of age is greater if the child will ultimately be a tall individual. Therefore, to know what the normal increment should be, one has to know the final growth attained either by actual measurement or by analogy to the growth of previously measured cases. Our consecutive data on growing children enable us to compare at subsequent ages actual measurements with predicted measurements and to determine the limits of error within which the height of similar groups of children may be predicted for ages far in advance of their actual years. Therefore, the possibility of accurate prediction lies at the basis of physical development at each age during childhood.

THE HEIGHT-WEIGHT INDEX OF BUILD AMONGST THE ITALIAN ADOLESCENTS OF FIFTY YEARS AGO

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In January, 1918, I published a memoir[1] in which I tried to obtain a synthetical idea of the course of development, that is, of the changes which take place during adolescence, according to the relation of $\frac{\text{weight} \times 100}{\text{height}^3}$ This quotient has received various names: Rohrer called it "Index der Körperfülle." I called it "Baric Index" and lately Bardeen[2] and after him Davenport[3] named it the "Height-Weight Index of Build."

I used many data, gathered from the tables of weights and heights published by Bowditch in 1877, by Roberts in 1878 and in 1882 (Final Report), by Weissenberg in 1911 and from others; but by far the most important are the data which Pagliani began to collect in 1872 and published in 1879, in which we find the behavior of the two sexes according to diverse social conditions, as is seen in the tabulation on page 31.

The most important fact shown up is the *microbary of adolescence.* The beginning of this period generally takes place at twelve years in the male and ten years in the female, but in the series divided according to social conditions the beginning of microbary takes place at the thirteenth year in the male, poor or rich, and in the female at the tenth year for the rich, eleventh for the poor. The end of this microbary takes place at the sixteenth year in the man, rich or poor; female microbary ends in the case of rich girls when the male begins, i. e., at the thirteenth year, whilst in the poor classes microbary continues for two more years; therefore, when we make no distinction of class, microbary ends at the woman's fourteenth year.

Microbary is therefore a period which lasts statistically from four to five

[1] Giuffrida-Ruggeri, V., L'indice barico. La microbaria dell'adolescence, l'allobaria sessuale e proposta di classificasione. Arch. di Fisiol., vol. 16, 1917–1918, p. 1–2.

[2] Bardeen, C. R., The height-weight index of build in relation to linear and volumetric proportions and surface-area of the body during post-natal development. Publication 272 of the Carnegie Institution of Washington, pp. 483–554.

[3] Davenport, C. B., Height-weight index of build. Amer. Jour. Phys. Anthrop., vol. 3, 1920, no. 4.

AGE	NUMBER OF OBSERVATIONS	WEIGHT	HEIGHT	HEIGHT WEIGHT INDEX	AGE	NUMBER OF OBSERVATIONS	WEIGHT	HEIGHT	HEIGHT WEIGHT INDEX
				Wealthy classes					
		kgm.	*cm.*				*kgm.*	*cm.*	
8	10	22.7	122.0	1.24	8	20	22.8	120.2	1.39
9	16	25.7	125.4	1.32	9	28	25.06	124.8	1.28
10	13	27.5	128.5	1.28	10	44	27.28	130.6	1.21
11	21	30.7	133.6	1.28	11	58	28.47	133.5	1.18
12	35	33.0	137.0	1.28	12	45	31.80	139.4	1.18
13	56	35.5	142.5	1.21	13	41	37.57	146.4	1.21
14	58	41.7	150.6	1.21	14	32	43.02	152.1	1.25
15	35	46.4	157.5	1.18	15	32	45.60	154.3	1.25
16	38	51.5	163.8	1.17	16	18	45.74	155.3	1.23
17	46	55.0	164.0	1.25	17	10	48.46	155.3	1.30
18	27	57.0	164.5	1.27	18	8	47.60	155.0	1.28
				Poor classes					
8	36	20.5	115.0	1.35	8	80	18.5	111.8	1.32
9	27	21.8	120.0	1.26	9	78	20.9	118.0	1.27
10	44	24.4	125.6	1.22	10	77	23.4	124.2	1.23
11	75	26.0	128.5	1.21	11	61	26.0	130.0	1.18
12	75	28.0	132.0	1.22	12	80	28.5	135.2	1.16
13	80	31.5	138.6	1.17	13	36	31.4	138.5	1.17
14	53	32.3	140.0	1.18	14	16	32.9	144.5	1.08
15	25	39.5	148.6	1.19	15	6	36.9	145.0	1.21
16	16	41.5	151.2	1.21					
17	10	43.2	151.4	1.25					
18	6	45.0	154.3	1.23					
19	6	46.7	156.0	1.23					

years, but as this statistic result is made up of all individuals, those in whom microbary begins early and those in which it continues late, we can say that the individual period of microbary is about three years. This period coincides in each individual with his period of youthful macroskely as it is the lengthening of the lower limbs (which takes place in adolescence) that lowers the relation of weight to height; the weight does not increase in equal proportion to the lengthening of the limbs.

Naturally it is possible that this greater development of height takes place precociously in a certain number of individuals, it is these precocious developments which suddenly lower the curve of the height-weight index before the true period of youthful microbary begins, as is seen in the male at the age of 9 years (8 years in the rich classes) and in the female at the eighth year.

On the whole it is clear that social conditions have small influence on the male microbary. On the contrary *the female sex feels the influence of the different social conditions very much*, as we find a more precocious and shorter microbary in the wealthy classes. As in this class puberty takes place a year earlier, according to many statistics, and on the other hand, puberty is preceded by a relative increase in height which is without a corresponding increase in weight, it is natural that microbary appears earlier in rich girls than in poor.

The concatenation of the phenomena of development is very precise in the woman and has such determinism that it explains perfectly the accelerating or retarding influence of good or bad nutrition. If the phenomenon of serious and prolonged microbary is dependent on the conditions of nutrition the height-weight index may be considered as a new index of good, sufficient or scarce alimentation. We may consider as a *very deficient* index that which gives the relation of weight to height below 1.15, a *deficient* height-weight index from 1.16 to 1.20, a *sparse* height-weight index from 1.21 to 1.25, a *good* height-weight index from 1.26 to 1.30, and an *exuberant* height-weight index over 1.30.

But, as the three first categories always represent a greater or less degree of microbary, we may first divide the height-weight index as follows:

For adolescence

Microbary	X–1.25
Mesobary	1.26–1.30
Megabary	1.31–X

and as in development microbary is a normal fact within certain limits, we may then subdivide it thus:

Extreme microbary	X–1.15
Oligobary	1.16–1.20
Normal microbary	1.21–1.25

With this division and subdivision we have a complete scale whose application for comparative purposes is very useful.[4] For example, we may thus say that in the poor classes of Turin, as it was about half a century ago, there was extreme microbary in girls of fourteen, at the age of eleven to thirteen years only oligobary and also in the males of thirteen to fifteen years, whilst in the wealthier classes one finds only an oligobary of two years (eleven to twelve for girls and fifteen to sixteen for boys).

[4] For adults I have proposed another subdivision which varies in the two sexes, and is referred to in the Amer. Journ. Phys. Anthrop., vol. 2, 1919, no. 4, p. 489. Consult also: Giuffrida-Ruggeri, V., L'indice a barico in certe seziono di popolasione e nei due sessi. Riv. di Antrop., vol. 23, 1919.

Now that economic conditions are so much better that one may say that a materially poor class no longer exists in Turin, it would be interesting if some disciple of Professor Pagliani took up his master's work again to see what physical amelioration has taken place in Turin in relation to the economical amelioration, especially as that town is the only one in the world where it is possible to make such a comparison, thanks to Pagliani's researches begun half a century ago. For such a research only good will is required as it is not at all difficult to weigh and measure the height of some hundreds of adolescents of both sexes; these are in fact the only measurements which require no technique and are therefore always comparable, even after some years, to those taken by others.

HEIGHT-WEIGHT INDEX OF BUILD OR ROBUSTNESS

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The height-weight index of build has been investigated by a number of authors with considerable divergent results.

In a recent publication Professor C. B. Davenport[1] treating of this index states:

> The conclusion from table C then is that for the entire developmental series from birth to thirty years the ratio of weight to the 2d power of the height gives a better index of build than any other ratio (l. c., p. 475).

As is well known, the ratio here elicited had been proposed by Quetelet, who says that weights of individuals of different heights, who have attained their full development, are, approximately, as the square of their statures. B. A. Gould and other authors confirmed these empirical results.

It is doubtful that this singular and interesting law of relation of height to weight gives the most satisfactory index of build.

The purpose of this paper is to illustrate the value of the height-weight law with a new ratio, which appears more satisfactory.

This is how I have proceeded. I have availed myself of the data tabulated by Livi[2] in tables XX and XXIV, and from this data I have plotted the curves represented in chart A with cross-section paper. Spaced horizontally, from the origin O along the abscissa OP are placed the successive average of weights from kgm. 54 (1 cm. represent 1 kgm.). Spaced vertically from the same origin O along the upright or ordinate OS are placed the corresponding statures (1 cm. represent 1 cm. of the height).

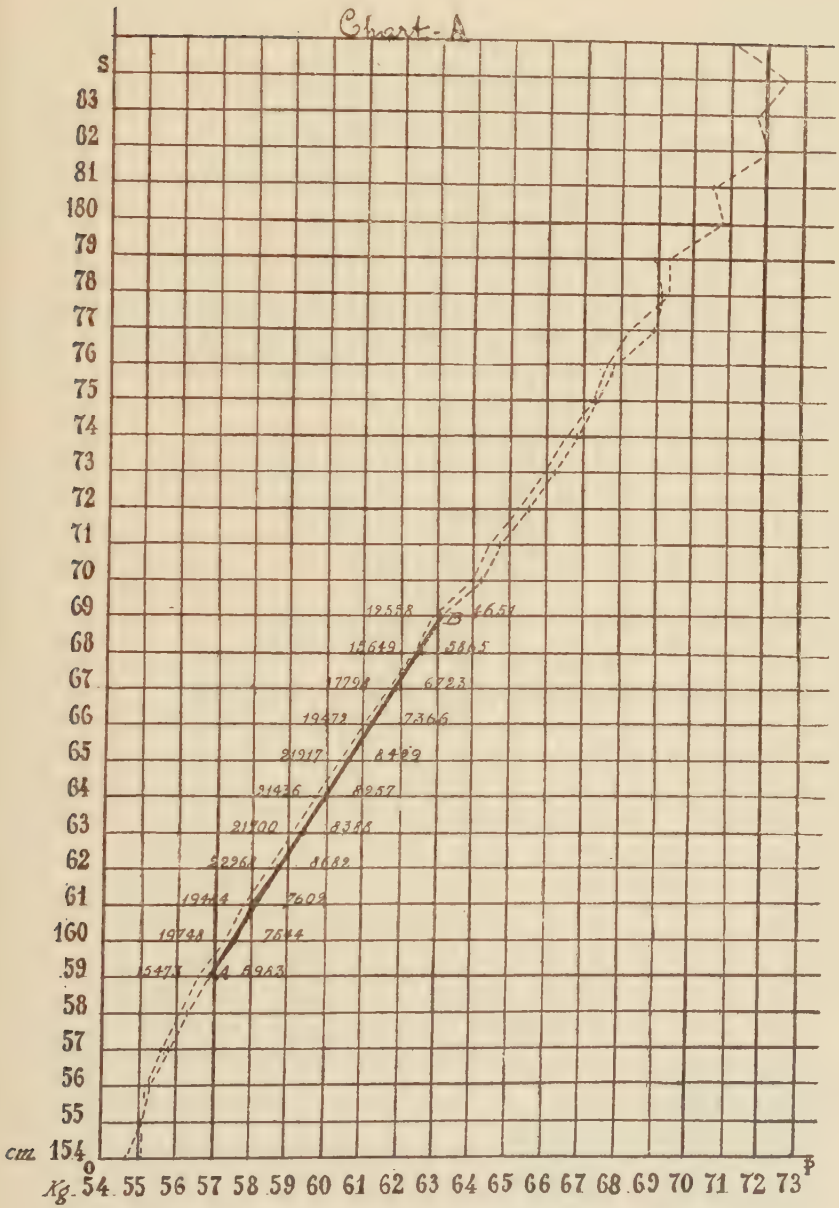
The portion of plotted curves, corresponding to the largest observations and labelled AB shows a straight line, which represents the average diagram.

If in the general equation of a right line

$$Y - Y_o = m\,(X - X_o)$$

[1] Davenport, C. B., Height-weight index of build. Amer. Jour. Phys. Anthrop., vol. iii, no. 4, 1920.

[2] Livi, R., Antropometria militare. Parte II; pp. 121 and 132. Roma, 1905.



-.-.-.-.-.-. Height-weight index curve of Italian recruits 19 to 23 years of age and over.

The total number was 299.356

+---+---+---+ Height-weight index curve of Italian recruits never sick

The total number was 113.732

we put

$$Y = S = \text{measured stature from } O$$
$$Y_o = S_o = \text{initial stature} = \text{cm. } 154$$
$$X = P = \text{weight corresponding to measured stature}$$
$$X_o = P_o = \text{initial weight} = \text{kgm. } 54$$

we have this following equation:

$$S - S_o = m\,(P - P_o) \tag{1}$$

Now we must know the true value m.

This can be determined with the trigonometric tangent of the angle which the right line AB forms with the abscissa OP (angle 58°; m = tang. 58° = 1.60); or take a couple of values of the diagram corresponding to the points on the straight line AB, which represents our function.

For example, taking the couple

$$S' = 160 \text{ and } P' = 57.8 \text{ (}s\text{. diagram)}$$

and referring to equation (1) we have

$$S' - S_o = 6$$
$$P - P_o = 3.8$$
$$m = \frac{S' - S_0}{P' - P_0} = \frac{6}{3.8} = 1.60$$

Thus the equation of the straight portion of the curve A — B assumes the very simple form

$$S - 154 = 1.60\,(P - 54)$$

from which

$$\frac{S - 154}{P - 54} = 1.60 \tag{2}$$

or

$$S = 1.60\,P + 67.60 \tag{3}$$

The results of experiments, and theoretical considerations, as we have seen, both point to the following law:

L'accrescimento della statura, a partire da cm. 154, sta all'accrescimento corrispondente del peso (che é di Kgm. 54) nel rapporto costante espresso dal numero 1.60.

It is of course understood that this law does not apply absolutely in every case, yet it expresses the normal or mean relation connecting a given stature with the corresponding weight.

This illustrated law, when extended to earliest years of life, for the period of development from birth on, evidently requires modification, which would have been made by the child-welfare organizations and possibly pediatrists.

OTHER FORMS OF THE LAW GOVERNING THE RELATION BETWEEN STATURE AND WEIGHT IN ADULTS

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Having calculated by means of the formula of the normality of the height-weight index of build

$$P = \frac{S - 67.60}{1.60} \qquad (1)$$

the normal theoretical weights corresponding to the statures, centimetre for centimetre from 1.54 m. to 2.00 m., it is seen that the law already explained in the preceding paper[1] can be presented under other characteristic forms, more practical and therefore from a certain point of view worthier of consideration.

Letting S = the stature; P = the corresponding weight; D the difference of two successive weights, and Δ the difference between the centimetres of stature, in excess of 1 metre, and the corresponding weight, and Δ_1 the difference between the successive deltas, one obtains table 1.

Observing the differences derived in the third column it is seen that the weights succeed each other in an arithmetical progression whose rate is 0.625. One can therefore derive the following law: *In young Italians beyond the stature of 1.54 m. and the relative weight of 54 kgm., weights increase in arithmetical progression at the rate of 0.625 for every centimetre increase of stature:* or expressed in symbols

$$P = \text{Kgm. } 54 + (0.625 \times X) \qquad (2)$$

where X equals the number of centimetres by which the stature, under consideration, exceeds the initial stature of 1.54 m.

If now the fourth and fifth columns of the table are observed, one can verify the fact that the Δ_1's(differences between the centimetres of stature exceeding the metre and the corresponding weights) increase in arithmetical

[1] Frassetto, F., Delle relagioni fra il peso e la statura nell nomo adult. Reale Acc. Naz. Lincec, vol. xxx, s 5^a 2^a sem. fas. 12 Roma, 1921. La Medicina Italiana, Anno III, N. 1. Milano, 1922.

Frassetto, F., Height-Weight Index of Build or Robustness (above).

progression, the rate of which is 0.375 which results lead to the very simple law for determining the normal theoretic weight which corresponds to every particular stature: *In young Italians beyond the stature 1.54 m., the weight*

TABLE 1

Table of relative weights (P) for individual statures (S), measured centimetre by centimetre, from 1.54 m. to 2 m., calculated according to the formula of the normality of the height-weight index of build $P = \frac{S - 67.60}{1.60}$. *The said formula has been derived by measuring 113,319 Italian conscripts, none of whom were ailing.*

S	P	$D = P' - P''$	$\Delta = S - P$	$\Delta_1 = \Delta' - \Delta''$	S	P	$D = P' - P''$	$\Delta = S - P$	$\Delta_1 = \Delta' - \Delta''$
m.	*kgm.*				*m.*	*kgm.*			
1.54	54,000		0,000		1.78	68,999		9,001	
1.55	54,624	0.625	0,376	0.375	1.79	69,624	÷0.625	9,376	÷0.375
1.56	55,249		0,751		1.80	70,249		9,751	
1.57	55,874		1,126		1.81	70,874		10,126	
1.58	56,499		1,501		1.82	71,499		10,501	
1.59	57,124		1,876		1.83	72,124		10,836	
1.60	57,749		2,251		1.84	72,749		11,251	
1.61	58,374		3,626		1.85	73,374		11,626	
1.62	58,999		3,001		1.86	73,999		12,001	
1.63	59,624		3,376		1.87	74,624		12,376	
1.64	60,249		3,751		1.88	75,249		12,751	
1.65	60,874		4,126		1.89	75,874		13,126	
1.66	61,499		4,501		1.90	76,499		13,501	
1.67	62,124		4,876		1.91	77,124		13,876	
1.68	62,749		5,251		1.92	77,749		14,251	
1.69	63,374		5,626		1.93	78,374		14,626	
1.70	63,999		6,001		1.94	78,999		15,001	
1.71	64,624		6,376		1.95	79,624		15,376	
1.72	65,249		6,751		1.96	80,249		15,751	
1.73	65,874		7,126		1.97	80,874		16,126	
1.74	66,499		7,501		1.98	81,499		16,501	
1.75	67,124		7,876		1.99	82,124		16,876	
1.76	67,749		8,251		2.00	82,749		17,251	
1.77	68,374		8,626						

corresponding to each particular stature is equal to as many kilograms as there are centimetres exceeding the metre in the stature under consideration, by 0.375 taken as many times as there are centimetres of difference between the stature in question and the initial stature of 1.54 m.

Letting c = the centimetres of stature in excess of one metre and δ the difference subtracted, the formula in symbols is as follows:

$$P = c - (0.375 \times \delta) \qquad (3)$$

Let us now verify the exactness of the new formulas (2) and (3) in relation to the first one (1), taking two particular statures, for example that of 1.60 m. and that of 1.94.

For the stature of 1.60 m. we have

By formula (1) $P' = \dfrac{S - 67.60}{1.60} = \dfrac{160 - 67.60}{1.60} = 57.75$

By formula (2) $P' = 54 + (0.625 \times X) = 54 + (0.625 \times 6) = 57.75$

By formula (3) $P' = c - (0.375 \times \delta) = 60 - (0.375 \times 6) = 57.75$

For the stature of 1.94 m. we have

By formula (1) $P'' = \dfrac{S - 67.60}{1.60} = \dfrac{190 - 67.60}{1.60} = 79.0$

By formula (2) $P'' = 54 + (0.625 \times X) = 54 + (0.625 \times 40) = 79.0$

By formula (3) $P'' = c - (0.375 \times \delta) = 94 - (0.375 \times 40) = 79.0$

The verification could not be more perfect nor would it be otherwise.

Before finishing this exposition it will be useful to state that the rate 0.625 at which the weights follow each other can be deduced directly from formula (1) in the following way

Having $S = 1.60\,P + 67.60$

$S + 1 = 1.60\,P' + 67.60$

subtracting one has

$$+ 1 = 1.60\,P' - 1.60\,P$$

or

$$\frac{1}{1.60} = P' - P''$$

which shows that the difference of 1 centimetre of stature always corresponds to the difference in weight as $\dfrac{1}{1.60}$ which is precisely equal to 0.625.

REMARKS

In judging the normality of the weight of an individual, according to this table, it is useful to keep in mind that the values there listed represent, for each stature, the central values of normality. Consequently we ought to judge as normal also individuals who have weights whose values fall within this field which, however, we are not yet in a position to limit.

It can be extended up and down from the true medium central in the ratio of 7 per cent of this same value as several authors have proposed, or it can also oscillate between 5 per cent and 10 per cent.

It should be added that, from the scientific point of view, it would have been much better, for a more exact calculation of the nutritive efficiency of the body to establish the formula of normality, comparing the weight of the body to its length instead of to its stature; and probably, the law would present itself in a form not quite identical with that obtained. Lacking, however, the sufficient number of observations of the length relative to the weight, we must for now confine ourselves to stature: especially, as practically we know, that to obtain the corresponding length we have only to take away the two centimetres, which ordinarily are considered as the average normal difference between the two quantities, or heights: and we can still make use of the same table.

In order to obtain the relative weights to the fraction of one centimetre of stature, you add to the table weight which corresponds to the stature which is nearest to the stature of which you wish to determine the exact weight, 0.0625 for every millimetre of stature, by which the stature under consideration exceeds the stature of the table.

HARMONIC AND DISHARMONIC RACECROSSINGS

JON ALFRED MJØEN

Winderen Laboratorium, Norway

When we were sitting in the Lap-tents in northern Norway, Elizabeth Rensberg (fig. 1.) told me that she had no Nordic ascendents, and her black, straight hair, yellow-grey skin, high cheek-bones, broad flat nose, small stature, verified her statements.

I was not so sure about Morten Rensberg (fig. 2.) on account of the shape of his head and the color of his hair. But there is a long step even from Morten Rensberg to the type, which we call the Nordic race.

As characteristics of the Laplanders (Same, Sabme) we find: Low stature, round skull, broad face, high cheek-bones, broad flat nose, yellow-grey skin, uneven small beard, dark (oblique) eyes, black straight hair, and mongoloid features.

Examination of eye color among the Laplanders in one encampment in Finmarken gave:

Black-brown	4
Dark-brown	15
Greenish dark brown	5
Greenish light blue	12
Grey	2
Blue (with brown spots)	17

Other encampments gave somewhat lower figures for blue. In the Röbus district with much less race mixtures than in Finmarken the blue and light brown eyes were more scarce. For instance there were only 3 blue eyes out of 14 counted and 4 cases of light brown hair or blond hair out of 14 in one encampment. In other encampments somewhat higher figures were obtained for blue; the blue never representing a pure blue (Martin no. 16). In other words a pure blue color such as is very frequently found in the middle part of Norway—Gudbrandsdalen and Österdalen—was never found among the Laps.[1]

[1] The figures given here for eye-color are too small to be of much value. I would advise the reading of Brigadelage Halfdan Bryn: "The Anthropology of Tröndelagen."

FIG. 1

FIG. 2

The highest and lowest figures found for head-index and body-height by Laps in northern Norway

	LOWEST	HIGHEST
Head index male	81.5	86.0
Head index female	80.0	84.0
Body-height male	144.0	157.5
Body-height female	136.0	150.5

FIG. 3. LAPS FROM LJUSNEDALEN—SWEDISH NORWEGIAN FRONTIER

As characteristics of the Nordic race we find: High stature, long skull, cuniform face, vertical profile, narrow high nose, light complexion, heavy beard, blue or light brown eyes, blond or light brown hair; and, above all, the nordic features.

I feel that I may arouse some opposition in the audience when I say that light brown eyes and light brown hair are features common to the Nordic race. But I am inclined to believe that there is a greater distance between light brown eyes and dark brown or black eyes, than there is between blue eyes and light brown eyes.

It seems to be generally agreed that the old vikings were of powerful stature[2] and had long skulls, heavy beard and blond or very often red hair. But the eyes? Were they only blue? And, if so, did the blue eye originate

Fig. 4

with the race or did the blue eye develop from a darker one? In other words: Was the brown eye the original, and did the blue eye slowly develop from

[2] The size of the grip of swords found from that time indicates that their hands were not so large or broad as generally supposed.

FIG. 5. RELATIVELY PURE NORDIC TYPES

Dark blue eyes, light brown hair, and all other measurable features falling inside of the range of such measurements for the Nordic race.

the brown one, or is the light brown eye the result of mixture between two distant races, the one with blue, the other with black eye-color? Investigation in the animal kingdom points in a certain direction.

When Laps are crossed with the Nordic (or Alpine) blood we are confronted with a long series of the most difficult problems: Does the one race dominate over the other? Does the one race impose on the other its somatic and mental qualities? Will weakness of either be strengthened by mixture with the other race? Will qualities be blended or appear again as separate units? Are these units really units or a scale of qualities with a maximum and minimum limit? Will we in this mixture of qualities have

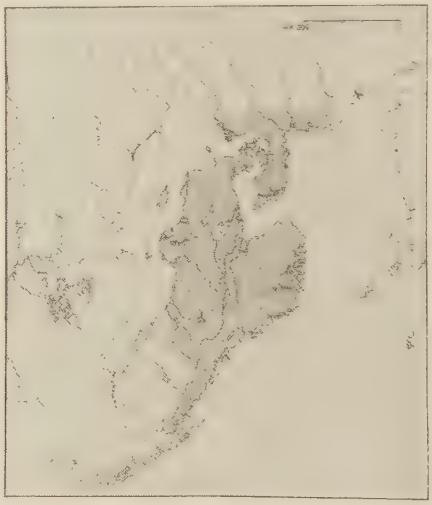

FIG. 6. EXTENSION OF THE NORDIC RACE ACCORDING TO OSCAR MONTELIUS, 2000 YEARS B.C.

contrasted characters characters which in their original combinations (the purer race) appeared as "harmonic" and now in the hybrid appear as "disharmonic" characters?

Characters. Will there be a certain affinity between the uninherited units, so that we find relatively pure types of the original race in the race-conglomerate? Is there a diminished or an increased fertility, or for some generations only diminished or increased fertility? Will a mixed race in the case of antagonistic germ plasm die out or shall we one day have a world of black-white-yellow race-chaos? Will race then be an absurdity?

The above chart was sent to our laboratory from Professor Lundborg.

When we compare the hybrid or bastard with one of the parent races, we see more clearly that the appearance of the hybrid comes nearer to the Nordic than to the Lappish race.

Jonas (to the right) looks like a Norwegian and the little boy also, although Jonas is one-half and the boy three-fourth Lap, as far as we were able to determine. It would however be a too superficial manner of regarding the matter, if we should conclude from this that the one race dominates over the other. If we investigate more closely we find that this is not the case. I should like to have more time to go into details. But to-day it

FIG. 7. MIXED-RACE TYPES (LAP × NORWEGIAN)

is the mental qualities, rather than the somatic, which will occupy our interest.

Already the first time I visited the Laps in Northern Norway as a boy of eighteen, I made the acquaintance of a certain type of humans, which enjoyed very little respect in the Lap-encampments. It was the hybrid between Lap and Norwegian. The main mental feature of this type was an unbalanced mind. I called the type later the M. B. type (M. B.—Manglende Balance—Want of Balance.)

One of the cases that I collected on my first voyage runs as follows:

A Lappish woman, whose brothers and sisters, parents, nephews and nieces all from a comparatively healthy and normal stock and a Norwegian (with *some* Alpine blood?) have four children, two M. B. sons, one M. B. daughter and one normal but incapable daughter. The M. B. daughter has by a normal Lap one M. B. child and one presumably normal. The Norwegian's ascendents and lateral relatives are unknown. If these are all normal, it would be natural to conclude that we have to do with an disharmonious crossing. But as nothing definite is known about the family on the Norwegian side, it is possible that this Norwegian was bearer

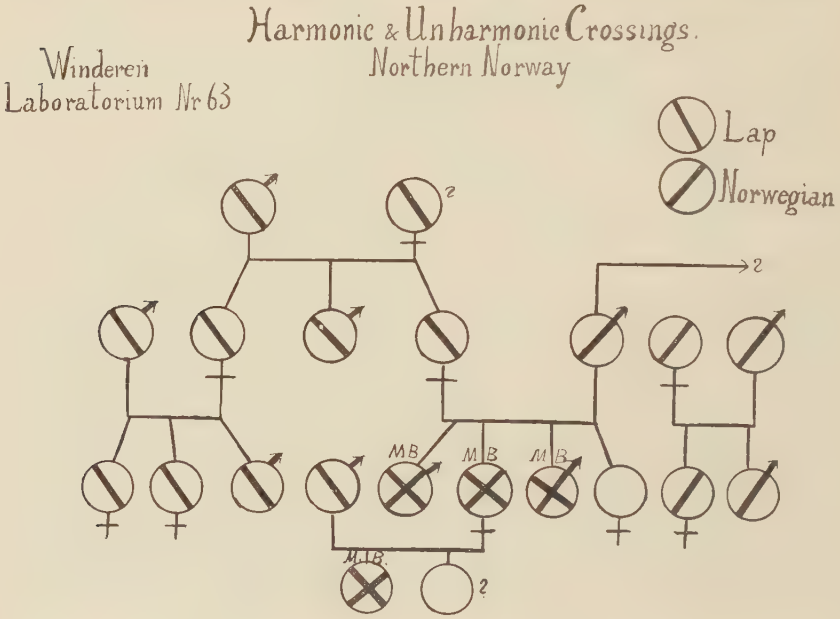

Fig. 8

of defective hereditary traits from which resulted the M. B. offspring by the Lappish woman. Such instances as this can therefore not be scientifically applied.

Another pedigree of a disharmonic sort is given in figure 8. The crossing between a normal and healthy Lap and a normal and healthy Norwegian produced three M. B. types, in the F_1 generation and one M. B. type in the F_2 generation. Unfortunately the ascendents on the Norwegian side are unknown and consequently we must be careful in drawing the conclusion that it is the crossing between two races alone which in this case has caused the disastrous result.

I have a collection of such pedigrees almost all but not all pointing in the same direction. But before we draw conclusions we must have more knowledge about the quality of the parental germ plasm than we have in the case quoted above. In the following case we have *some* knowledge (Figure 9).

Ingwill-Ola was not feebleminded. He was an M. B. type: good-natured, willing, unbalanced, unreliable. His four grandparents were Tater, Finlænder, Norwegian, Lap.

Although Ingwill-Ola had great difficulty in understanding the difference between mine and thine and found much more interest in telling a story than telling the truth, and although Ingwill-Ola could not see why he

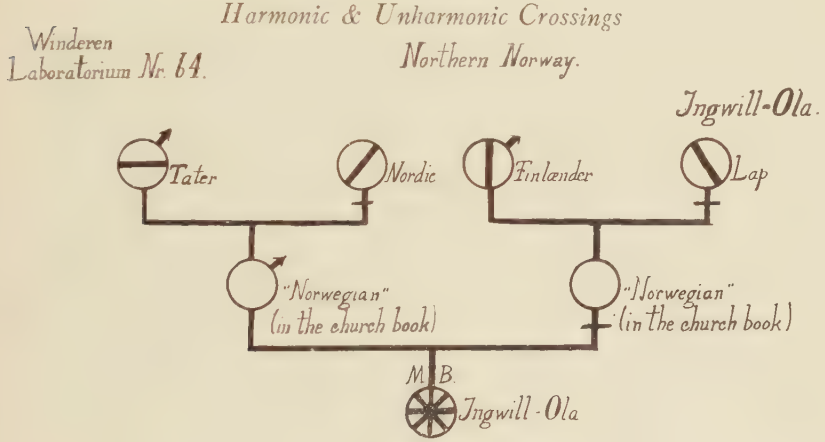

FIG. 9

should not empty the whole brandy-bottle at once—he was the most be loved man in the little town of Røros in Norway. His prison-terms were short and had a rather jolly and innocent character. And when he died the whole town was mourning because they had lost the best topic of conversation which they had had at the family table for more than thirty years. He was somewhat of an historical personage.

Another pedigree of disharmonic race crossing is given in Figure 10. The bastard was almost "a head" larger than his Norwegian father. His frame and appearance are Nordic; hair, eyes, skin, Lappish. The father of the bastard, the Norwegian civil officer, had probably some Alpine blood. He was in service till he was ninety-one and died when he was ninety-six years old. His wife died at the age of eighty-six. They had two children,

a son now sixty-seven and a daughter of seventy-six—both in good health, and having together 10 normal healthy children. The Norwegian civil officer had an illegitimate child by a Lap woman, who later married a man of her race, by whom she had 3 healthy normal children. The bastard was an M.B. type, who left 3 children of the same type. They had to be taken care of by the community. In this last case we are justified in draw-

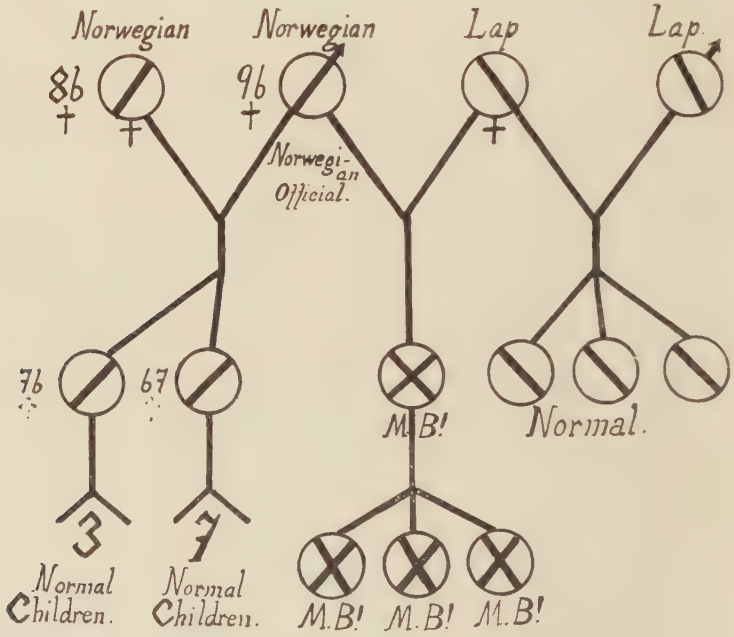

FIG. 10

ing the conclusion that it is the crossing between two "distant" races which has caused the unbalanced unharmonic offspring. When the parents are crossed with their own race they procreate individuals only of high or normal value.[3]

[3] Many of our most energetic colleagues are constantly complaining that we can not make any experiments with human material. It is good that there is a limit to our wishes, otherwise the whole world might be turned into a biological experimental laboratory. But in the case reported above, it seems as if nature has undertaken to make the experiment for us.

During a journey in Finmarken where many Lap-families carry distinct and measurable signs of race-mixture (Kvæn, Lap, Norwegian), I found amongst 22 such families 36 tuberculous children out of 76. Later on I have found somewhat lower figures.[4]

Observations and measurements taken amongst the Laps in the north of Norway lead me to formulate the distinction: *Harmonious* and *disharmonious* crossing. I found for example four cases of crossings between the Nordic race and Laps (in Ljusnedalen) in which the half-breeds were superior as regards stature to both of the progenitors, and as regards mental powers to the Laps among whom they were living.[5] But I also found 9 cases of half breeds. (Norwegian × Lap) belonging to what I have called the M.B. type (wanting in balance, and showing as their main symptoms, stealing,

FIG. 11. PHOTOGRAPHS OF TWO PROSTITUTES

The one at the left being such owing to unfortunate surroundings; the one at the right being such on account of disharmonic race mixture; she is of the N. B. type.

lying, drinking). In *some* of the last cases the Norwegian surely also had Alpine blood (fig. 11).

Figure 12 is from a photograph of three out of 11 children in one family of whom 6 have poor mental abilities and 5 were complete idiots. (From Finmarken near the Russian frontier.)

[4] The lecturer demonstrated a map showing the mortality by tuberculosis in the different parts of the country, the mortality being lowest in that part of the country where no or hardly any race-crossing has taken place: Kristians amt, Buskeruds amt, and very high in that part of the country, Finmarken, where almost half of the population can be characterized as "distant races" from the Nordic race—Laps, Kvens, Finns. As the Laps gradually cease to live their nomadic life they come in closer contact with the Norwegian peasants and fishermen and a steadily increasing race mixture is taking place.

[5] Whether high stature signifies strength, health and vigor, and intellectual superiority signifies higher morals, is another question.

The medical officer for the county Dr. Ottesen, Vardø, who has reported the case to the Winderen Laboratorium, has given an account of several cases of which the following is one. It is, as he says, characteristic of the present mode of thinking and reasoning of local authorities: A man sixty-nine years old of bad reputation suffering from syphilis—a woman thirty-five years of age, formerly a prostitute, feebleminded, begging from house

FIG. 12

to house, had to be supported by the parish—these two married. The parish was pleased that this woman got a man to support her. Result: four children, of whom two are feebleminded, a third has already been sent to the reformatory and the fourth is epileptic.[6]

[6] To prevent social evils of this kind a program for negative, positive and prophylactic racehygienics was worked out at the Winderen Laboratorium in 1908. Parts of this program have already entered legislation in Norway. The program was read at the Congress after the opening address by Leonard Darwin, "The Aims and Methods of Eugenical Societies."

The difficulties or dangers in drawing conclusions from human material as given above are among others the following:

(1). The number of ascendents or sidelines is mostly not large enough. (The number of individuals in the stock measured does not necessarily need to be *very* large.)

(2). The spoken word can not always be relied upon.

(3). Not even the churchbook carries the absolute proof. It is more common than generally believed that the baptized child has got another name entered in the churchbook than that of the father in biological sense. Many of the observations and conclusions which have been built up on churchbook registration must therefore be considered worthless.

Since I as a boy got acquainted with the bastard whose pedigree is charted in figure 10, who drove me in the mountains in reindeer sledge (pulk), the M.B. problem has occupied my interest. And many years later I went into the animal-stable in my Laboratorium in Winderen in order to get an answer to the question: Does crossing between two or more distant races of *animals* (for instance of rabbits) give results that could throw some light on the human problem?

Crossing between white "Smaalen" and French "Vedder" gave in 3 litters 17 bastards of the type shown in figure 13, second generation. It looks at first sight as if the one race dominates completely over the other, as not one of the 17 is white like the one parent. Closer investigation shows however that the 17 bastards have inherited many qualities from the White Parent also.

It was further found that certain characteristics of the original parents—white fur, yellow-brown fur, red eyes, brown eyes, upstanding or hanging ears, carriage of the body, moving, jumping, number of births and deaths in the separate litters—did not amalgamate but appeared again as separate units among the hybrids. For example, the pure bred French "Vedder" had on repeated occasions always 3, as a rare exception 4 young ones, the pure-bred "Smaalen" 6 to 8, by way of exception 5. The hybrids had not any mean number between the two parent races but in all cases 5 to 8 young ones. But not all characteristics of one original progenitor dominated; on the contrary the hybrids possessed side by side certain characteristics from both of the original parents, for example: upstanding ears from the Blue "Bever," yellow-brown fur from the "Vedder," etc.[7] Also

[7] We are now trying to determine each organ: heart, lungs, etc., and take the weight, size, structure of these organs, also the blood-bodies under the microscope, footprints from jumping. Also physiological characters, e.g., taste for certain food, etc., some of which seem to follow Mendel's law as heritable traits.

amongst human half-breeds (Norwegian and Lap) certain characteristics of the original progenitors appeared unmixed, e.g.: lighter or dark complexion side by side amongst different individuals of the same hybrid generation.

Thus both amongst animals and humans it is the special character and not the race which dominates.[8] In the fourth and fifth generations some of the animals were considerably smaller in weight than the first generation and the second generation, i.e., the F_1 generation. In the F_1 generation the animals are sometimes larger and heavier than the largest of the two parent-

Fig. 13

races. (See fig. 14, second generation.) A most striking parallel to the fact that the above described human bastard (see fig. 10) was 5.5 cm. taller than his Norwegian father. (For details see fig. 15, third to fifth generations where the pictures are taken from living material. In Figure 14 there are smaller errors on account of the photo being taken from "stuffed" material).

[8] The lecturer emphasized that in this brief summary he was not able in every case to make the necessary reservation. Thus there were of course many exceptions to be found: yellow-brown fur frequently changed somewhat into grey, upstanding ears showed imperfect dominance even in the second generation, etc.

TABLE 1

Crossing three races (rabbits). The figures give the weight of the adult animal in grams

	BLUE "BEVER" × FRENCH "VEDDER"				FRENCH "VEDDER" × WHITE "SMAALEN"				AVERAGE 4122.5 AND 4280
I gen.....	3875		4370		4150		3410		
II gen. F_1.....	4645			×	4160				4402.5
V gen. F_4.....	3150	3190	3080	2800	2560	2610	3410	3850	3081.25

FIG. 14

The imposing height (or rather length) and weight have generally to date been considered as a good feature, indicating strength, vigor, and health. In a pamphlet dated 1908 I gave expression to my doubts on this point. And the result of my experiments has convinced me that this "over-growth" is a weakness. In later generations the size and weight were somewhat reduced in some of the animals. This reduction was not so marked by the crosses of *two* races alone but by crossing three races it came out very markedly.

Experiments were next undertaken to discover the results of crossing 3 races of rabbits. The races used were (fig. 16, top row, left to right) Blue Beaver (Blaa Bever), French Vedder and French Vedder Hybrids from the above crossings, which were again crossed and their offspring in turn (fig. 16, second generation).

The sexual instinct has for some of the individuals in the fifth generation almost disappeared and in the case of others the young ones die immediately

Fig. 15

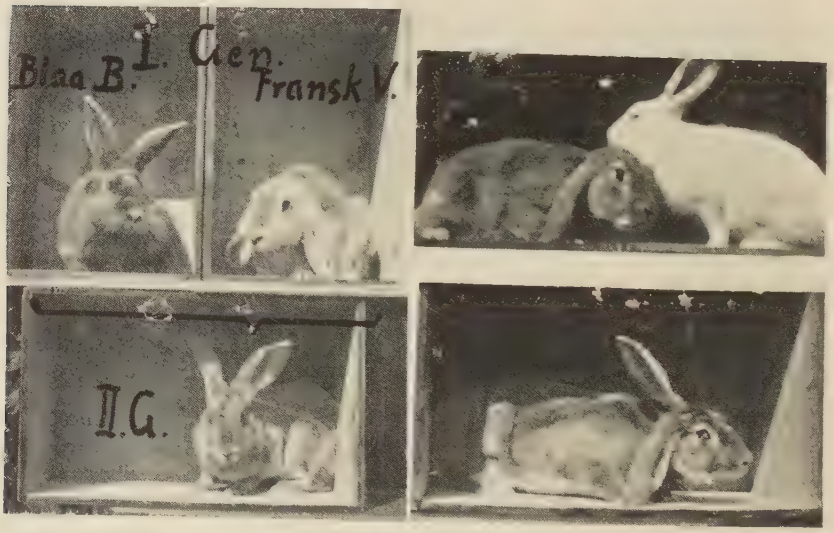

Fig. 16

after birth; the number of young ones being greater in the second and third generation and smaller in the fifth. The percentage of mortality rose from 11 per cent in the original progenitors to 38 per cent. These triple-crossed

hybrids had 58 per cent female offspring. The most remarkable result was the great difficulty in bringing about copulation. In many cases the attempt had to be given up all together. In 6 months for example there occurred only 1 single case of fertilization amongst 8 females and 1, afterwards 2, male rabbits, which were allowed to run together in a hutch of the fifth hybrid generation. There was noted a great decrease in size and weight of body in the F_3 and F_4 generations.

A more distinct outward sign of a disharmonic crossing can hardly be imagined than is found in three hybrids with one upright and one pendant ear (fig. 17).[9]

FIG. 17

Of course such a rabbit need not necessarily suffer any harm from having one ear upright and one pendant. But it is very useful as a symptom of disharmony in general. Why should only the ears be effected? We ought to be suspicious in regard to every organ: heart, lungs, kidneys, bones. And

[9] Here the lecturer referred to such works as those of:
Eugen Fischer, Hottentot-Boer harmonic crossing.
Davenport, Mulattoes, disharmonic.
Lundborg, Racecrossings in Sweden, disharmonic with one exception: Wallons-Swedes.
Sapper, (Central Americans) unharmonic.
E. v. Eickstedt, Gurkha × Hindu, harmonic. Parallel observations amongst planthybrids made by *Erwin Baur* and *Nilsson-Ehle* point in the same direction.
F. v. Luschan's works on races are not at hand. As far as I remember Prof. Luschan does not object to any crossings from the standpoint of healthy, practical, social-political anthropology.

we must be suspicious in regard to every chemical reaction in the cells and every physiologic-chemical function from the blood cells to the composition of the stomach juice. In fact we must be suspicious in regard to the whole organism of the hybrid, when we see this most striking disharmony.

Closer investigation shows that changes must have taken place in regard to the harmony in the bone structure also. The way or mode of jumping and holding—carrying—the body indicates such changes and the extinction of the sexual instinct and the mortality of the young point to a disharmony of a more deep-seated radical nature.

Even if we are not allowed in general to draw conclusions from one to another species of animals and less so from animals to humans, nevertheless the results of these experiments reveal certain analogies with human crosses which doubtless can be referred back to the same principles, the same natural powers. The most striking analogy or resemblance is that the hybrid in both cases is exceptionally large in the F_1 generation. Compare table 1 where the weight of the hybrid animal excels the weight of the heaviest of the parent races in the proportion 46 to 43 and Figure 10 which shows the ascendents of a human hybrid where this hybrid is almost a head larger than his Norwegian father.

When some scientists are inclined to think that many hybrids represent a good human type, we must not forget that they consider the larger size of the hybrids as a symptom of health, strength and vigor. I have tried to show that this criterion is treacherous.

In a paper read in Medicinerforeningen, Kristiania, 14 years ago, I expressed my doubts about the so-called "purifying effect" of blood-mixture" when foreign "fresh" blood entered the country. And I drew attention to the fact of high mortality from tuberculosis among the half breeds of Northern Norway.[10] It seems as if later investigation has verified my statements.

My opinion is that not alone tuberculosis but also many other diseases and many social evils, e.g., the increasing criminality (from mentally disturbed race elements), is partly due to disharmonic racecrossing. Not

[10] Lundborg found that the industrial centers in Sweden stand comparatively high in regard to tuberculosis if there is no or very little race mixture.

In the little pamphlet of 1908 I wrote: "Crossing between distant races seems to lower the niveau somatically and mentally but our knowledge is very small. Racebiology is a new science. But I hardly doubt that we will be able some day, perhaps by biological-chemical means (blood-analysis?) to ascertain what races may safely be *crossed and the chemical laws will then be fundamental for the moral.* The woman of the future will feel antipathy towards a man of strange (disharmonic) blood, just as the woman of the present day feels antipathy towards one who is not of her standard in life.

only the crossing of one race with another ought to be avoided, but of course also certain crossings within the same race. *Some crossings are in fact constantly removing undesirable characters and some crossings constantly creating new miseries for mankind.* To find out why is the most urgent work for the racebiologists. It is a fact that during the last decades an unfortunate mingling of races has increased to an enormous degree as the result of new communications (railroad, steamship lines and autos) and our humanism and tendency to immigration. The migrations of nations in former times were, biologically regarded, harmless in comparison with those of the last ten or twenty years. Over the German frontier there have come in from the East 600,000 people of by no means the best racial elements, while the United States have had to accept a migration almost three times as large within a corresponding period of years.

It is now fourteen years since I wrote suggesting obligatory biological registration of all citizens: ("Race-biology, the hygiene of propagation," Winderen Laboratorium, 1908) as a means of making it more easy for us to prevent undesirable elements, especially strange races, from entering our Scandinavian countries. The biological obligatory registration should make all movements of the folksmaterial lighter, easier and more advantageous for all who belong to our race or related races and are willing to work and make the radius of operation smaller and smaller for all saprophytes on human society,—those unwilling to do the fundamental work.

We have seen today that two individuals from two good stocks can procreate one or more M.B. types if they belong to different races, in other words can procreate caricatures of human beings. We have also seen that two individuals from good stocks but with *comparatively*, – I say *comparatively*,—insignificant endowments can rise to a physiological optimum if the stocks are congenial to each other.[11] *One crossing gives a fool, another a genius—one mating gives sickness and another health, one a criminal, another a useful citizen. The combination alone can give surprising results –harmony and disharmony.*

Dr. Mjøen emphasized very strongly that we must adopt quite different means in order to arrive at certain results as to "harmonic" and "disharmonic" crossings in regard to mental qualities. We must select one mental quality which can be measured with certainty and follow this one up through several generations. For this kind of measurement musical talent is best suited of all mental qualities. The lecturer then gave an account of measurements of musical traits carried out at Winderen Laboratory.

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[11] The lecturer points here at a part of his lecture about measurements of musical traits and the origin of Genius.

SUMMARY

1. In crossing two or three animal races, it is the single quality that dominates, and not the one race over the other. Such single qualities or separate units are also found in the later generations of human racecrossings.

2. There are many striking analogies between the results of racecrossings (defects) observed among humans and the results from racecrossings in animals.

3. The "over-growth" in F_1 generation found in animals and humans (distant races), which according to the current opinion indicates strength and health, has to be looked upon as abnormal and consequently as a weakness.

4. Crossings between widely different races can lower the physical and mental level. Such disharmony as that described above which has been assumed to occur through a crossing between *two* races, may become quite distinct in a crossing between more than two races.

5. The figures for tuberculosis are the smallest in that part of Norway where the Nordic race is comparatively pure (1.1 to 5) and largest in that part of the country (Finmarken) where the race mixture is the largest (3. 6 to 4. 0).

6. Prostitutes and the "unwilling to work" are found more frequently among types showing strong racemixture than among the relatively pure types (Fig. 11).

7. It seems as if the immunity which a race or a population has gained towards certain diseases is unfavorably influenced by racecrossings. It seems as if the original disposition (for disease) which has been eliminated by selection (the weakest dying out) in the original population appears again when the two immune races are being crossed.

8. Until we have more definite knowledge of the effect of racecrossings we shall certainly do best to avoid crossings between widely-different races, and nourish and develop a strong and healthy race instinct. By removing the bilinguistic barrier (compelling, e.g., the Laps to learn Norwegian and Swedish) *we are building the first bridge, safe and sure, to a blood mixture between the two races which we will deplore and regret when it is too late.*

9. We must not draw conclusions from one racecrossing to another. Each race must be examined in its relation to another race.

10. We can not and we shall not persecute any race. No individual is so physically, mentally or morally depraved that he does not deserve our care—so also the race. No individual must be treated with contempt, not even the criminal. But we must learn something new; namely, to distinguish

between the right to live and the right of other races to mix their blood with ours and—give life.

11. Our opponents generally say that we should wait to take eugenic measures in *general* and steps against racecrossings *especially* until we have more knowledge. I admit that we need and shall seek more knowledge, *much* more knowledge! But—as our experience up to date points decidedly in one direction it will be safer to turn the matter around and say: *Until we have acquired sufficient knowledge be careful!*

12. *We shall prevent racecrossings not on the ground that we are so much better than all other races. We shall love and protect each of us our own race for the same reason that we love our father and mother: Because it is our race!*

A NATIONAL FUND FOR A NEW PLAN OF REMUNERATION AS A EUGENIC MEASURE

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Harvard University

The purpose of this short paper is to supplement in an essential manner a suggestion which I made in a paper read before the British Sociological Society in the year 1909.[1] In that paper I pointed out that the fall of the birth-rate among the more educated classes in Britain, which was generally admitted by all persons competent to form an opinion to be a very serious matter, was in the main due to voluntary restriction of the family (by celibacy, late marriage, restraint in marriage and the use of contra-ceptive methods) and that this in turn was due in the main to economic or prudential considerations. The twelve years that have elapsed since my paper was read have brought abundant confirmation of these propositions and evidence that they hold good, not only for Britain, but also for America and most of the leading nations of Europe. And the war has made even more urgent than before the need for measures which may counteract this prevailing and increasing tendency. My suggestion was that the custom of remuneration of all classes of workers selected in any way on account of general or special capacities should be reformed, on the principle that the wage or salary paid to each such worker should be increased by a stated proportion (provisionally I suggested 10 per cent) in respect of each living child during its minority. I pointed out, (1) that this reform could hardly fail to counteract in some degree, and probably in a very large degree, the prevailing tendency to low birth-rate among all such selected classes of workers; (2) that it could have no evil effects; (3) that remuneration on this plan would be essentially just and would therefore be approved by public opinion.

I said that the reform could be effected without any difficulty in the remuneration of all paid servants of the state and of such public bodies as the municipalities and suggested that, if adopted by the state and municipalities, the essential justice of the new plan might lead to its becoming customary throughout the community. A number of criticisms of my suggestion were made, and I found no one who had a good word for it. Most of the criti-

[1] A practicable eugenic suggestion. Sociological Papers, vol. 11, London, 1909.

cisms seemed to me quite pointless, but one of them brought out a real difficulty. It was pointed out that though there was no essential difficulty in the way of the adoption of the new plan of remuneration by the state or other bodies dispensing public monies, there could be little hope of its general adoption by any institution or corporation whose affairs are administered on strictly business principles. Because on all occasions of appointing (or promoting) a salaried officer or wage-earner, the persons responsible for the appointment would give the preference to a bachelor or to a man having few children, as against a man having many children. Further reflection upon this difficulty has led me to see that it can be overcome and, so far as I can see, in one way only. That way is the creation of a "National Fund" for the supplementing of family incomes according to the "New Plan." It is desirable that such a fund should be created forthwith in each country by appropriations made by the national governments. But since there is little prospect of this being done until public opinion shall be much more educated in respect to eugenic principles, and until the situation shall have grown obviously alarming to the average citizen, it is much to be desired that the nucleus of such a fund should be created by the benevolence of one or more wealthy men. I submit that if the late Mr. Andrew Carnegie or Mr. Rockefeller, or both of them, had devoted all their magnificent gifts to this purpose, they would have achieved far more for the enduring welfare of mankind than can be expected from all the institutions they have so liberally endowed. It may fairly be hoped that, if the national fund be instituted in this way, its operations would later be made permanent and be extended as far as might seem expedient, by appropriations from the national treasury, or by a national loan raised for this specific purpose.

Surely the nation may mortgage its future credit more legitimately on behalf of this plan than on behalf of any other; for the adoption of this plan would go far to secure to it in the future the greatest asset that any nation can desire, one without which all other forms of wealth are of no value, namely, a population sound and vigorous in both mind and body.

OBSERVATIONS AND QUERIES AS TO THE EFFECT OF RACE MIXTURE ON CERTAIN PHYSICAL CHARACTERISTICS

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INTRODUCTION

Morphological details are possibly of more value as racial criteria than measurements of absolute size or indices of proportions. Many of these details appear consistently in combination in any given racial type, although they are by no means invariable. Usually they do not lend themselves to measurement but must be classified according to form and degree of development. Probably most physical anthropologists would be unable to identify a cranium from the mere perusal of its measurements and indices, whereas, in many instances, it is a simple task to classify a skull as to race by simple examination of morphological details and without the aid of calipers. To one who is familiar with the customary morphological combinations of the crania of certain races, new and unexpected combinations of such details appear as hybird and disharmonic as do the features, pigmentation, and hair form of living hybrids, who are readily recognized as such even by laymen. On account of the rarity of skeletal material definitely known to be of hybrid racial origin it is usually impossible to formulate positive conclusions as to the inheritance of such osteological features in race mixtures. But it may be worth while to record tentatively some laboratory impressions. In the case of skeletal material they are tentative impressions because based upon unsatisfactory numbers of observations. In the cases of the soft parts they are observed facts, but also based upon insufficient numbers of cases. The present writer ventures to present this material with a full realization of its inconclusive character, but with the hope that it may direct the attention of investigators to certain hypotheses of race inheritance, whether for verification or disproof.

I. SKELETAL FEATURES

There are many indications pointing toward the conclusion that the soft parts are more easily modifiable through functional or environmental causes than the skeletal framework. In the opinion of the present writer morphological skeletal features are relatively stable and persistent. If the

manner of inheritance of such features in racial crosses could be ascertained it would serve as a more dependable basis for racial analysis than the more fluctuating morphology of the soft parts.

a. Negroid skull texture

For a number of years I have been impressed by the belief that Negroid crania are characterized by a distinctive bony texture. I am still somewhat skeptical as to the reality of this belief, but, as yet, have been unable to refute it. This Negroid skull texture is observable especially in fresh and well preserved bones. It is usually indistinguishable in dry, eroded, and badly preserved specimens. It consists, as far as I am able to observe, in a superior density and compactness of the external and internal tables of the bones, and, possibly, in a greater thickness of these tables than is ordinarily met with in other races. As a result the surfaces of the cranial bones of Negroid skeletons are often unusually hard and smooth and, for some reason, take on a peculiar yellowish brown patina which often gives them an ivory-like appearance. I have observed this peculiar texture both in thick-walled and in thin-walled Negroid crania. From a large assortment of miscellaneous disarticulated cranial bones of different races I have been able to select those belonging to Negroid skulls on the basis of this texture and patina. I do not claim to be able to do this in every instance. This same texture and patina is observable, though not so markedly, in the crania of Dravidians, in certain Libyan crania from the Siwah Oasis, and in the crania of Fijians. It appears to be most distinctive in crania which exhibit Negroid features most plainly. In many crania of Bantu negroids this skull texture is extremely obvious, whereas other Negroid features, such as prognathism, flat nasal bones, etc., are almost entirely lacking. This leads me to the supposition that Negroid skull texture is likely to persist in race mixtures when many other distinctively Negroid features have been altered. I have never observed this Negroid skull texture in the crania of American Indians except in one case from New Mexico, which on this and other morphological grounds appears to me to have been a Negro-Indian hybrid.

Whether or not there is any histological basis for this supposed Negroid skull texture I have not attempted to determine. Professor J. S. Foote has demonstrated racial differences in the structure of the femur conditioned by developmental advances in the circulation.[1]

[1] J. S. Foote, A contribution to the comparative histology of the femur. Smithsonian Contributions to Knowledge, vol. 35, no. 3, 1916.

The circulatory system in bone. Smithsonian Miscellaneous Collections, vol. 72, no. 10, 1921.

The femora of white races have smaller medullary canals and thicker bony walls than those of other races. There are also histological differences into which I cannot enter here. That similar racial differences occur in the structure of the cranial bones is highly probable and worthy of investigation.

b. European sutural complexity

It is well known that marked racial differences exist in the degree of complexity of the cranial sutures. In general the sutures of Europeans are most complicated. The racial differences are most apparent in the coronal suture which rarely attains a high degree of complexity, except in members of the European race. The sagittal and lambaoid do not always show the same differences and the latter is not infrequently very tortuous in the crania of non-European races, the coronal sutures of which are relatively simple. When, in examining the crania of Hawaiians, American Indians, or other non-European groups I encounter a specimen with unusually complicated coronal suture I usually look for other morphological features which might indicate an admixture of European blood. In the majority of instances corroborative evidence is not lacking. It has not been my privilege to examine any considerable number of racially mixed crania of definitely known antecedents, with the exceptions of mixtures among the allied European races. On the basis of my laboratory impressions, however, I am inclined to believe that in crosses between races characterized on the one hand by simplicity of the coronal suture, and on the other, by complexity of that suture, the offspring will usually show a tortuous and complicated coronal suture. This is probably associated in some way with increased cranial capacity as compared with the more primitive of the parent stocks.

c. Form of the nasal bridge and nasal aperture

A low and broad nasal bridge is a primitive and an infantile character. It is retained as a racial character in Negroids and Mongoloids. The high narrow nasal bridge which is characteristic of European races is probably correlated with reduction of palatal breadth and palatal area, and collapse of the maxillary sinus consequent upon degeneration of the masticatory apparatus. The narrowing of the nasal aperture is probably brought about by the same cause, but may also have been affected in some groups by the breathing of cold and rarefied air. Narrow, high nasal bridges and narrow nasal apertures are relatively late human developments if we assume man to have differentiated in a tropical environment. High, wide nasal bridges are possibly either blends or adaptations of the respiratory

organ for the breathing of cool air unaccompanied by reduction in the masticatory apparatus. The form and proportions of a nasal bridge and nasal aperture are hereditary. Observations both on crania and on the living yield ample assurance that in crosses between races with low, broad nasal bridges and those with high, narrow nasal bridges the hybrid usually shows an approximation to the latter nasal form. The immediate elevation of the nasal bridge is usually the most striking effect of crossing a European with a member of a low-nosed race. Even a very small admixture of leptorrhine blood has this effect upon Negroid races. But the primitively broad nasal aperture seems to be less readily affected by such crossings. According to the observations of the present writer the typical hybrid nose, though elevated and often narrow at the upper part of the bridge, is broad at the middle and the base. The nasal aperture in such crosses does not attain to the exaggerated breadth characteristic of certain purely platyrrhine races but it seems to approximate to the more primitive form.

Indistinct inferior nasal borders and prenasal fossae associated with relatively undeveloped nasal spines are characteristic of many primitive races. Sharp and elevated inferior borders are associated with reduction of the subnasal portion of the alveolar process, and high nasal spines are associated with high nasal bridges. I am not sure which of these sharply contrasted forms of nasal spine and lower border persist in crosses between leptorrhine and platyrrhine races, but I am inclined to think that the form of lower borders tends to be modified toward the more highly evolved type. The Eskimo with his excessively narrow nasal aperture, low nasal bridge, and undeveloped nasal spine and lower borders, probably shows the maximum effect of purely respiratory nasal adaptation without masticatory reduction.

d. Prognathism

Prognathism, or protrusion of the jaws, is a simian reminiscence. There is probably little or no functional basis for prognathism of a pronounced degree in any modern race. The Eskimo, who perhaps alone of all modern peoples, shows progressive condition of the masticatory apparatus, has developed no extreme prognathism. Nothing in the diet of extremely prognathous modern races, and nothing in their masticatory habits necessitates the retention of prognathism. Increased palatal area in the Eskimo, as in most hard-chewing primitive peoples, is brought about by enlargement of palatal breadth. It therefore seems fair to assume that prognathism is a functionally unstable character. This being the case it is very natural that crosses between prognathous and orthognathous races invariably result in

a pronounced decrease of prognathism in the hybrid and often in a complete disappearance of this protrusion. Both cranial evidence and observations on the living are indicative of this conclusion. In Africa a small admixture of the blood of an orthognathous race appears greatly to lessen Negro prognathism. A slight degree of alveolar prognathism however seems to be rather persistent in crosses.

e. Dentition

The writer is not familiar with many features of dentition which exhibit clear racial differences. The shovel-shaped incisors characteristic of American Indians and other Mongoloid stocks, as described by Dr. Ales Hrdlicka are possibly the best example of a dental feature of diagnostic value in race analysis. I do not know whether or not this form of incisor persists in race mixtures. I am under the impression that Negroid teeth are characterized by a certain quality of the enamel which usually gives them a bluish or yellowish tinge that is recognizable, in conjunction with certain peculiarities of form which are very hard to describe. I believe also that these Negroid features persist in Negro-white mixtures, but I cannot adduce any satisfactory body of evidence to substantiate this belief.

Hawaiian teeth, as observed in the crania of ancient Hawaiians are often remarkable for the perfection of their enamel and their pearly whiteness. I have noticed these absolutely distinctive Hawaiian teeth in the skull of a hybrid-Hawaiian.

f. Head form, face form

The study of head form is rendered difficult by our lack of knowledge as to what constitutes a primary type and what should be regarded as a secondary type. The assumption of a monophyletic origin of man possibly carries with it the implication that the various extremes of head form are derived from a primitive mesocephalic progenitor with a cranium of medium height. On the other hand it is possible that there may have been two ancestral types of head-form, a long narrow, and low type, and a short broad and relatively high type. Medium types might then be regarded as derivatives of the preceeding. Or perhaps all primary types irrespective of their cranial indices have been derived from ancestral forms with small or medium height. Although it does not seem possible to settle these questions on the basis of present knowledge, we may certainly distinguish certain types of head-form which are undoubtedly modifications of primitive types or blends of the extremes of head form. For example, the present writer regards the long, narrow, and high cranium of the Eskimo, with its

scaphoid vault, as a head-form unquestionably modified by extreme specialization of the masticatory apparatus.

Many mesocephalic types are obviously disharmonic blends, and this is particularly clear in series of crania belonging to any group of racially diverse origin, in which one parent stock is brachycephalic and the other dolichocephalic. For in such cases one may observe the morphological features and proportions of each ancestral race disharmoniously combined in many of the hybrid offspring. I should be inclined to consider any modern group to be of hybrid or composite racial origin, an adequate series of whose crania shows a modal number of mesocephals. Furthermore, I doubt that any physical group characterized by large proportions of both extremes of head-form in the *norma verticalis*, may reasonably be considered a racial unit, no matter how homogeneous such a group may be in the morphology of its soft parts, pigmentation, hair form, etc.

The hybrid meso-types which I desire to distinguish are the following:

1. A type with a very broad frontal region, with a parietal region very little exceeding the frontal region in breadth, with a very flat lambda region, associated with a protuberant occiput. The height of the skull is usually great. This type has a brachycephalic appearance, viewed from the front, because of its great frontal breadth; it also looks brachycephalic in profile because of its height and short, curved parietals. But when the length is measured the protrusion of the occiput usually throws it into the mesocephalic class.

2. A type with medium or narrow frontal region, medium or narrow parietal region, parallel temporal planes, but a flat occiput. This type is also rather high and appears to be dolichocephalic, when viewed from the front, on account of its slight breadth.

3. A type with a narrow frontal region, broad, short parietal region with prominent tuberosities, very divergent temporal planes, but an out-jutting occiput. The frontal region is usually receding, and the height of the skull great.

These three types frequently occur in populations where dolichocephalic strains and brachycephalic strains have crossed, as in Central Europe or the Canary Islands, and the last two types are frequently found among North American Indians. These types are obviously composed of a combination of the regional proportions of the parent stocks. In such racially mixed series there occur types which in general resemble one or other of the original stocks, side by side with these disharmonic combinations which I have described. In the case of ancient Canary Island crania the females tend to preserve the ancestral types, while a majority of the males present a blended skull form.

The relation of face-form to head-form is very obscure. There is no satisfactory evidence pointing toward any constant association of a stated face-form with a stated form of the brain-case even in relatively pure races. Correlations of the facial indices with the cranial index are usually small and often negligible, sometimes positive and sometimes negative. It would seem reasonable to expect a natural association of a long, narrow face with a long, narrow head, and a short, broad face with a short, broad head. This expectation is sometimes realized and frequently is not. Yet we call long, narrow crania with short, broad faces disharmonic, and apply the same term to short, broad crania with long, narrow faces. The question arises whether or not such disharmony is due to racial mixture. It is certainly very prevalent in some racially mixed peoples. The dolicho-euryprosopic type is more frequent than the brachy-leptoprosopic type. Mesoprosopic and mesene facial indices are most numerous in the majority of physical groups and are associated indifferently with dolichocephalic, mesocephalic, and brachycephalic crania.

II. SOFT PARTS

The present writer has not been privileged to conduct any anthropometric survey of living groups of racial hybrids but he is engaged in the study of a series of measurements, photographs, pedigrees, and hair samples of mulatto families in the United States, collected by Caroline Bond Day, a former student of Anthropology in Radcliffe College. This investigator has been able to secure data from about one hundred families up to the present time, and, in many instances, the charts show photographs of four or five generations with accurate information as to the percentage of Negro, Indian, and white blood in each. Usually it is impossible to secure photographs of the principals in the primary cross. The collection of material is not yet complete and the study of the data has scarcely begun, but certain preliminary observations may be of interest.

1. Variations in hair form and hair color

The Mendelian character of hair form and hair color inheritance is known from the researches of the Davenports and others. Hair samples from the collection mentioned above clearly show recessive, dominant, and intermediate forms. In general the curvature of the hair becomes less as the proportion of Negro blood in the family decreases. But this is not true in every instance. Sometimes mulatto hair shows no more curvature than quadroon hair. Octoroon hair usually shows about the degree of waviness

which is considered most desirable by Europeans. The length of the head hair in women seems to increase with the decrease in the proportions of Negro blood in the cross. Octoroon hair is often very long and abundant. The phenomenon of progressive hair pigmentation is usually manifest in families which have a Nordic strain in their composition, so that even where the Negro blood amounts to one-half some of the children are likely to have fine-textured, curly, blond hair in childhood, which gradually becomes very dark and coarse and more curved. In quadroons and octoroons a certain number of individuals are likely to have permanently light hair. Most of the samples of adult blond hair are those of females. In a minority of cases there appears a typical blond wavy octoroon hair which for length, fineness of texture, abundance, and brilliancy of its golden color is unsurpassed. In the majority of cases octoroon hair is, however, dark and coarse and quite wavy. It appears that in regard to hair form and hair color there are recessive and dominant quadroons and octoroons. A recessive quadroon may have much lighter and much less wavy hair than a dominant octoroon. Superficially there is nothing Negroid to be observed in the hair of these recessives. They have hair which most European women would be proud to possess.

In families where there is any considerable admixture of Indian blood, individuals are likely to occur with straight, coarse, and black, Mongoloid hair.

Regional variations in the hair form of individuals were directed to my attention by Mrs. Day, and I have had opportunity to observe them in various individuals. Often in families of mixed white and Negro origin, children and adults with relatively light and fine hair on most portions of the head may be seen to have coarse, dark and very curly hair at the temples and behind the ears.

2. Regional variation in nose form and lip form

The variations of the nose in the living are similar to those described with reference to the skeleton. Any considerable admixture of white blood usually brings about a relatively high and narrow upper bridge of the nose. But the middle portion of the nose is likely to retain a Negroid breadth. In most instances also there are Negroid reminiscences in the thickness and lateral flare of the alae, the relatively vertical plane of the nostrils, and the convexity of the septum. But recessive individuals with predominantly European nose form occur. One has to be very careful in the observation of nose form, not to be misled by thickening of the middle nose caused by fractures, or by pathological forms of the soft parts caused by obstructions.

The thickening of the integumental lips, and the puffiness and eversion of the membranous lips characteristic of full-blood Negroes are rapidly modified by an admixture of European blood. In many individuals of preponderantly Negro blood these Negroid features are not retained. Either one may occur singly in a modified form and neither is discernible in the majority of persons in whom the white blood is in excess.

3. Pigmentation

Unsymmetrical and progressive pigmentation seems to be characteristic of Negro-white mixtures. Of course there are standard regional variations in the pigmentation of individuals of whatever race. Often Negroids have heavily pigmented patches behind the ears, under the eyes, and in the sacral region. The genital organs, usually darker than most other regions of the body in whites, are likely to be very heavily pigmented in Negroids.

Yellow pigment flecks or yellowish areas in the sclerotic are very likely to persist even in very light individuals. Tanning and freckling are probably race mixture phenomena resulting from crosses of blonds with brunettes or heavily pigmented races. I do not believe that a pure blond freckles or tans. When a light pigmented race crosses with a heavily pigmented race the resulting offspring may be intermediate in skin pigmentation but certain individuals often tan or become progressively pigmented to a shade much darker than that characteristic of the more heavily pigmented parent racial stock. I am credibly informed that such is the case with many Hottent-Boer hybrids in German Southwest Africa and I suspect that such is the case in certain white Negro crosses, but I have not sufficient evidence to be positive on this point. There is no doubt, however, that even the lightest Negro-white hybrids tend to become much more heavily pigmented in old age and the blonds particularly are inclined to freckle. A combination of blond or red hair with fairly heavy skin pigmentation undoubtedly occurs in some instances.

Conclusion on inheritance of characters

It seems probable from the above considerations that in the case of race mixtures morphological features are inherited by the offspring in small units from both parent stocks. Often one type of feature in an organ seems to survive consistently at the expense of another. That this inheritance is of a Mendelian character is generally probable and has been more or less successfully demonstrated in a number of cases, notably by the Davenports and by Fischer. Often more primitive morphological features seem to

yield to the more highly evolved in the offspring of the mixture, as in the case of sutural complexity, form of the nasal bridge, prognathism, form of the lips, etc. But this is not always the case and there is not sufficient evidence to warrant a generalization.

III. ON THE POSSIBILITY OF ANALYZING MODERN RACES BY THE STUDY OF RACIAL HYBRIDS

Many of the human groups to which racial status is commonly accorded by anthropologists are undoubtedly of composite or hybrid racial origin, but through long continued interbreeding of the various racial elements and through selection have become a fairly homogeneous blend. A possibility of analyzing these races and of determining their constituent racial elements is opened up by the study of race mixtures. Sometimes a racial hybrid will conform to a racial type distinct from that of any of the parent strains. For example, in the study of individuals derived from a mixture of white, European Negro, and Indian strains I have observed types which are essentially Polynesian and particularly Hawaiian in appearance. There appeared in Man recently an article by L. G. W. Malcolm on certain Tasmanian half castes inhabiting Cape Barren Island, Bass Strait, Tasmania.[2]

A plate illustrating this article showed photographic reproductions of the head of various hybrid individuals. I was immediately struck by the resemblance some of these individuals bore to Dravidians. I asked a Hindoo graduate student in Anthropology, who had not seen the article, to identify these types as to race. He unhesitatingly pronounced them to be Dravidians. In this group of portraits the pure half caste European-Tasmanian hybrids were quite unlike either parent race in general appearance. Nor was there any strong resemblance to one particular parental type in the features of a quarter caste. The children of one family, the third generation from a primary Welsh-Tasmanian cross were five-eighths European, one-fourth Tasmanian, and one-eighth Australian aborigine. One, a girl of ten years, had light brown eyes, ash-blond hair, straight, absolutely European features, and, according to the author, she did not even speak like the rest of the islanders, who invariably elongate their vowel sounds. Her younger brother, according to the photo, is a complete Dravidian. The author says that his skin tint is dark brown, his eyes are dark brown, and his hair almost black and wavy. Two other individuals whose

[2] Short notes on the inhabitants of Cape Barren Island, Pass, Strait, Tasmania. Man, vol. xx, no. 71, pp. 145–147, October, 1920.

portraits were figured, but whose pedigrees were not given, bore an equally striking resemblance to the Dravidian race. If five-eighths European, one-quarter Tasmanian, and one-quarter Australian produces an European type when the aboriginal features are recessive and a Dravidian type when they are dominant, may not the study of race mixture throw light upon the origin of composite races?

HYBRIDIZATION AND BEHAVIOR

E. M. VICARI

Carnegie Institution

There has been a scientific interest in the behavior of mental traits but just how, and in what manner such characters are inherited has not been experimentally demonstrated. Mendel's law of inheritance opened our eyes to the reason why a given individual, or organism, possesses this or that particular character. It has been proved that the inheritance of physical traits follows definite laws. How about mental traits? Do they follow these same laws? Some work has been done in this field but very little from the genetic standpoint. Attention has been directed to heredity as the explanation of mental disorders in man such as insanity and feeble-mindedness. But, normal traits have not been given as much attention. Dr. Mjøen, from Christiania, told us this morning about musical traits. Human material lacks the controlled matings and conditions, essential to complete genetic analysis, so we must look to the lower animals for such study.

One of the chief matters of interest in the investigation herein reported has been the effect on behavior of crossing two different races. General opinions have been advanced as to the possible effects of racial crosses, but these have seldom been backed up by scientific evidence. It has been claimed that the offspring of parents representing different racial groups, such as white and negro, or Teuton and Latin or Saxon and Latin, are intermediate between the two parents. With the present extensive knowledge of the method of inheritance such a generalization is impossible. Dr. Dunn showed this morning that the hybrids between Chinese and Hawaiian are intermediate in physical traits but that some differ from either parent race in head form. We have learned that individuals can transmit certain characters which they themselves do not manifest. Many representatives of characters (called genes by the geneticist) lie dormant and a few only have a chance to express themselves in the soma of the individual. Following the laws of genetics some factors are dominant, others are recessive, others are linked, still others manifest themselves only in the presence or absence of other factors. Now, when an individual with some dominant and some

recessive characters mates with an individual of another race representing a different set of dominant and recessive characters, what will be the result? Will the offspring be intermediate between the two parents, or like one or like the other, or like neither? In order to solve this problem a study on the genetic behavior of mice was undertaken. Two races decidedly different were used; Japanese waltzing and albino mice. The Japanese waltzer whirls around most of the time and is easily agitated, is physically weak and is easily disturbed by environmental conditions. The albino mouse is tame, fairly vigorous physically and not very active. Each of the two races is very homogeneous, having been inbred (brother to sister mating) for over 20 generations. The relative purity of the race can thus be assured since it takes about 17 generations for a strain to become homozygous, each member resembling the others in its genetic make up.

In order to test the mental behavior of each race a simple maze problem was used. One trial a day for 16 days was given to each animal. The results are based; (1) on the time they took to run their trials, (2) on the number of perfect trials, (3) on the number of consecutive perfect trials. The pure japs and albinos were found to be very similar when compared on the basis of the number of perfect trials and on the basis of the number of consecutive perfect trials. On the basis of time per trial the averages of the albinos tend to be lower than those of the japs. In spite of the manifest differences between the races it appears that their behavior in the same maze is very much the same.

Now, let us turn to the crossbred animals, the first generation hybrids. Physically these are like neither parent but are more vigorous than either and thrive well under unfavorable conditions. In color they resemble the wild gray mouse. In general behavior they are very responsive to changes in environmental conditions and are very quick and active like wild mice. The behavior of these hybrids in the same maze given to the parents is surprising; 10 per cent of the mice make more perfect trials than either parent race in the number of consecutive perfect trials. The time averages instead of being intermediate between those of the parent races, indicate that the hybrids are considerably faster than either parent. This last result remains the same when each family is considered by itself. There are, however, two groups of hybrids, those that exhibit fear in the beginning of the test and those that do not. After overcoming fear, however, the two groups exhibit the same type of performance. The results are based on 45 Japs, 75 albinos, and 110 hybrids. Perhaps there has occurred a combination of factors that has worked for greater vigor in the hybrids and which causes them to have lower time averages. When the hybrids once

learn they continue to show perfection, while the parent races in general retrogress after a time and must relearn; hence showing a fluctuating attention. On the other hand the hybrids exhibit a much longer period of attention than either parent and they have a greater ability to retain a habit once formed. It seems that the hybrids have combined the dominant and more vigorous characters from each parent and the result is that a larger number of vigorous characters are represented in them than in either parent. The facts are that the first filial generation is neither intermediate between the two parent races not like either parent race but rather possesses a greater capacity for learning accurately and for taking less time per trial. The results seem to demonstrate that the phenomenon of heterosis known in physical characters may also be found in traits of behavior. Two races, physically and mentally mediocre, have given rise to a race superior to either parent race in physical and mental traits. A study of the second filial generation is now being made.

THE MORTALITY OF FOREIGN RACE STOCKS

A Contribution to the Quantitative Study of the Vigor of the Racial Elements of the Population of the United States

LOUIS I. DUBLIN

Metropolitan Life Insurance Company, New York

My interest in this subject arose in connection with another study. Some eight years ago, I began to investigate the reasons for the increasing mortality of the American people after age forty-five. The mortality figures for the previous decade had shown that, while there had been very marked declines in the mortality rates of our population in infancy, in childhood, and in early adult life, that beginning with the age period forty-five and continuing well into old age, there had been a slight increase in mortality. This was very puzzling because such conditions did not appear in England, in Germany, or in the Scandinavian countries for which comparable data were at hand. This was evidently a condition characteristic of America. Why should there be such an adverse change in the death rate during a period of extraordinary activity in public health and when so much was being done to improve the sanitary conditions of the country? Living and working conditions were undoubtedly getting better all the time for the great mass of the population. But these improvements were not being reflected in the facts of the death rate for middle life and beyond. After much labor on this problem, it finally occurred to me that the facts could, perhaps, be explained very simply as the result of the character of our recent immigration. My hypothesis was that, if the foreign stocks that had been coming into the country in increasing numbers actually had a higher death rate than the native stock at the older ages of life, the very fact of their coming in would be sufficient to account for the increase in mortality of the whole population.

To test this hypothesis, it was necessary to construct tables of mortality for the several race stocks, including the native born of native parentage, the native born of foreign or mixed parentage and the foreign born. For the last group, it was necessary also to prepare tables for each one of the important foreign nativity classes. I turned to the data for the State of New York where there was a large representation of the three groups of the

population, where registration of deaths was good, and where I was fairly familiar with the living and working conditions of the people. Data were for the year 1910. The results were published in the *American Economic Review*, vol. vi, no. 3, 1916.[1] Later, assisted by Mr. G. W. Baker, I supplemented the findings for New York State with those for Pennsylvania.[2]

The following is a summary of our chief results. For more details, reference will have to be made to the two papers referred to above.

Table 1 presents a comparison of the actual facts of mortality in three principal classes according to nativity in the population of New York State in 1910. In both sexes, the death rates of the foreign born and of

TABLE 1

Deaths per 1,000 white population among native born of native parentage, among native born of foreign or mixed parentage, and among foreign born, by sex and by age period: New York state, 1910

AGE PERIOD	MALES			FEMALES		
	Native born of native parentage	Native born of foreign or mixed parentage	Foreign born	Native born of native parentage	Native born of foreign or mixed parentage	Foreign born
Ages 10 and over:						
Crude rate	13.8	13.2	17.5	12.4	9.7	16.6
Standardized rate	13.8	17.2	17.1	12.4	13.9	16.2
10–14	2.5	2.2	2.5	2.6	2.1	2.4
15–19	3.6	4.1	4.4	3.2	3.2	3.2
20–24	5.0	6.8	5.2	4.7	5.2	4.0
25–44	6.9	14.3	8.7	5.7	9.3	7.3
45–64	18.8	28.2	28.0	14.3	20.0	23.4
65–84	77.3	89.9	90.4	68.2	73.9	87.7
85 and over	268.9	323.0	272.7	242.3	324.9	270.5

their native born offspring are considerably in excess of those for the native born of native parents after the period of middle life is reached. There is little difference during the periods of childhood, of adolescence, and of early life; but there the similarity ceases. The excess mortality of the foreign stock reaches its maximum at about age sixty and continues to the end of life but to a less degree. In the important age period forty-five to sixty-

[1] Factors in American mortality. A study of death rates in the race stocks of New York State, 1910.

[2] The mortality of race stocks in Pennsylvania and New York. Quarterly Publications American Statistical Association, March, 1920.

four, the death rate of males (28.0) was 49 per cent higher than that for native males of native parentage. That for foreign born females was 64 per cent higher than for females of native stock. Similar conditions exist in the State of Pennsylvania.

In view of the fact that the foreign born and their native offspring make up a considerable proportion of the total population of both New York (63.9 per cent) and Pennsylvania (43.5 per cent), there is no room for doubt that our explanation of the increasing mortality after age forty-five is correct. The foreign born enter the United States, for the most part, as adults; they have lower vitality than the native stock and their addition to the population can have only one effect, namely, to increase the death rate at the middle ages of life and at the older ages.

Our problem today, however, is somewhat different. I propose to give you the results of our investigations with especial reference to the relative vigor of the several race groups that make up our newer immigration. Obviously, that is what will interest you as eugenists, concerned as you are with the character and potentialities of the various groups which are making the American of the future.

To determine the relative vitality of the several race stocks, we constructed a series of life tables from the facts of mortality already referred to. There is no better test, for they tell us the average after lifetime of each group. The figures of expectation were calculated beginning at age ten in each case because of the small number of foreign born persons living in New York State below this age. The figures for the five principal foreign races are given in the following charts, the countries of foreign birth being arranged alphabetically. The expectations for those born in the United States of native parentage are given for comparison.

With the exception of the Russian born, the native males of native parentage have a greater expectation at age ten than any of the foreign groups. In New York State, the Russians are almost entirely Jews who are noted for their longevity. At age ten, the expectation of Russian born males is 53.44 years, as compared with 52.96 years for native males of native parentage. Similar conditions have been described by various observers for Jews living in Germany, Russia and Hungary. They invariably have lower death rates and longer expectation of life than do the people among whom they live. Their addition to the population of New York State has, therefore, an effect very different from that of the other foreign peoples. They increase the longevity of the total population rather than decrease it. Next in order of longevity are the Italian males with a life span of nearly fifty-two years at age ten; next are the English, Scotch and Welsh, 50.27 years;

the Germans, 49.44 years; and the Irish, 38.69 years. The surprising fact of this chart is the very low life expectation of the Irish males. It is actually two years less than the expectation of negro males living in the Registration States at the same age. We shall attempt later to give some of the causes which are responsible for very unfavorable conditions in this race.

Among foreign born females, very similar conditions appear. The greatest expectation is found among Russian born females, who, at age ten, have an average after-lifetime of 55.82 years. This is almost identical with the expectation of females of native stock. Then follow in the order named

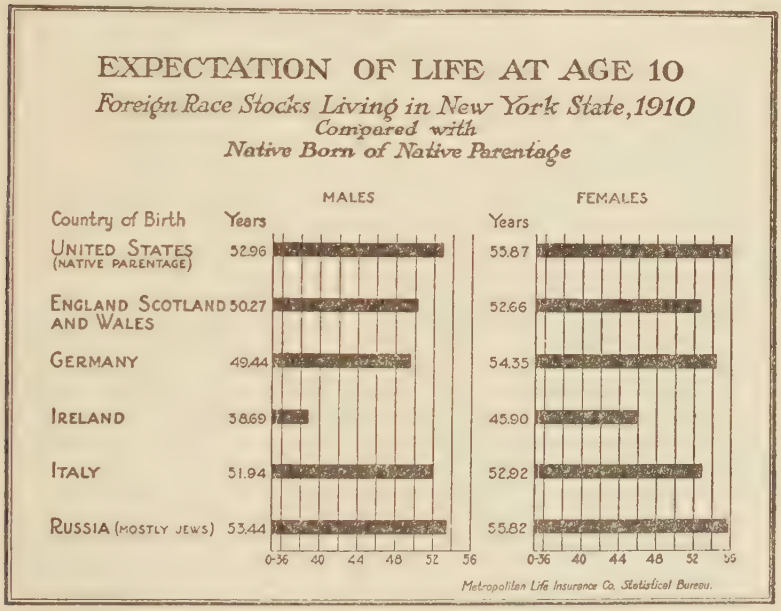

CHART 1

the females born in Germany, Italy, England, Scotland and Wales, and Ireland. In every case, the expectation of life for females is in excess of that for males of the same nativity group. The excess varies from seven years among the Irish to only about one year among the Italians.

The following table shows similarly the facts of the expectation at other age periods than ten for each one of the foreign race stocks as compared with the native born of native parentage.

In view of the interest that attaches to the several race stocks, we present a chart for each of them which shows the facts of mortality for the principal causes of death.

TABLE 2

Expectation of life at selected ages. By sex, for persons born in specified country and living in New York State, 1910

SEX; COUNTRY OF BIRTH	10	20	40	60
Males:				
Living in New York State, 1910. Born in:				
United States (native parentage)	52.96	44.80	29.22	14.92
England, Scotland and Wales....	50.27	42.23	26.79	13.78
Germany	49.44	40.80	25.49	13.25
Ireland	38.40	31.25	18.16	11.25
Italy	51.80	44.23	28.75	15.08
Russia (mostly Jews)	53.44	44.84	27.85	13.95
Living in specified country:				
England and Wales, 1910–1912...	53.08	44.21	27.74	13.78
Scotland, 1911	51.86	43.27	27.25	13.54
Germany, 1901–1910	51.16	42.56	26.64	13.14
Italy, 1901–1910	51.25	43.00	28.00	13.67
Females:				
Living in New York State, 1910. Born in:				
United States (native parentage)	55.87	47.55	31.57	16.30
England, Scotland and Wales....	52.66	44.01	28.17	14.86
Germany	54.35	45.57	29.31	14.60
Ireland	45.40	36.90	21.70	10.80
Italy	52.92	44.94	29.68	15.66
Russia (mostly Jews)	55.82	46.60	29.84	14.73
Living in specified country:				
England and Wales, 1910–1912...	55.91	47.10	30.30	15.48
Scotland, 1911	53.83	45.35	29.48	15.17
Germany, 1901–1910	53.35	44.84	29.16	14.17
Italy, 1901–1910	51.50	43.67	29.00	13.92

ENGLISH, SCOTCH AND WELSH

The mortality rates of the British are among the most favorable in Europe. Their addition to the population of New York State might, therefore, be expected to be a favorable one. Yet, as we have seen, the expectation of life of both males and females of this nativity falls from two to three years short of that of the native stock at age ten. The fact is that the expectation of the British living in New York State is about three years less than for men and women living in England. Among the several causes of death, we find higher death rates, among the British born, for cancer, organic heart disease, pneumonia and violence. They have lower

death rates for tuberculosis. The differences are never very great and it is difficult to single out any particular cause of death as especially responsible for the conditions described. For our purposes, however, it is important to remember that the British immigrant living in New York State does not show up as favorably either as do his own people in his native country or as the native stock in the United States.

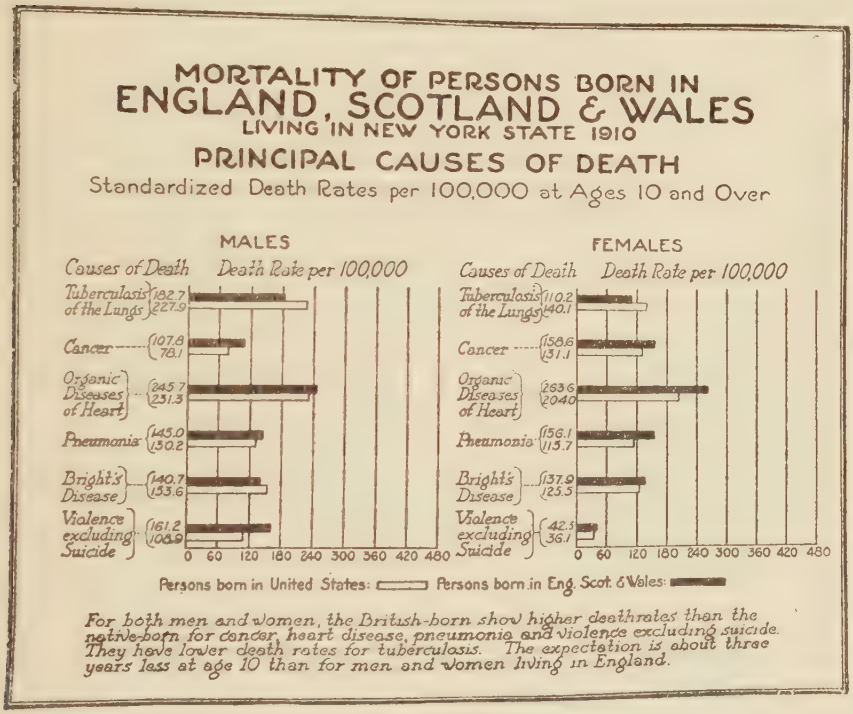
MORTALITY OF PERSONS BORN IN
ENGLAND, SCOTLAND & WALES
LIVING IN NEW YORK STATE 1910
PRINCIPAL CAUSES OF DEATH
Standardized Death Rates per 100,000 at Ages 10 and Over
MALES
Causes of Death
Death Rate per 100,000
Tuberculosis of the Lungs 182.7 227.9
Cancer 107.8 78.1
Organic Diseases of Heart 245.7 231.3
Pneumonia 145.0 130.2
Bright's Disease 140.7 133.6
Violence excluding Suicide 161.2 108.9
0 60 120 180 240 300 360 420 480
FEMALES
Causes of Death
Death Rate per 100,000
Tuberculosis of the Lungs 110.2 140.1
Cancer 158.6 131.1
Organic Diseases of Heart 263.6 204.0
Pneumonia 156.1 115.7
Bright's Disease 137.9 125.5
Violence excluding Suicide 42.5 36.1
0 60 120 180 240 300 360 420 480
Persons born in United States:
Persons born in Eng. Scot. & Wales:
For both men and women, the British-born show higher death rates than the native-born for cancer, heart disease, pneumonia and violence excluding suicide. They have lower death rates for tuberculosis. The expectation is about three years less at age 10 than for men and women living in England.

CHART 2

Immigration from England, Scotland and Wales into the State of New York has been of minor importance in recent years. In 1910, there were only 193,359 of these foreign born people in New York State, constituting 7.1 per cent of the foreign born and only 2.2 per cent of the total white population of the state.

GERMAN

The Germans constitute a very much larger group of the foreign stock in this state. In 1910, there were 436,874 German born persons, con-

stituting 16.0 per cent of the foreign born whites and 4.9 per cent of the total white population.

In this group, the males show up much worse than do the females. The longevity of males, as measured by the life table at age ten, is fully three and one-half years less than that of native males of native parentage; while the German born females have an expectation only one and one-half years less than that of females of native stock. With the exception of

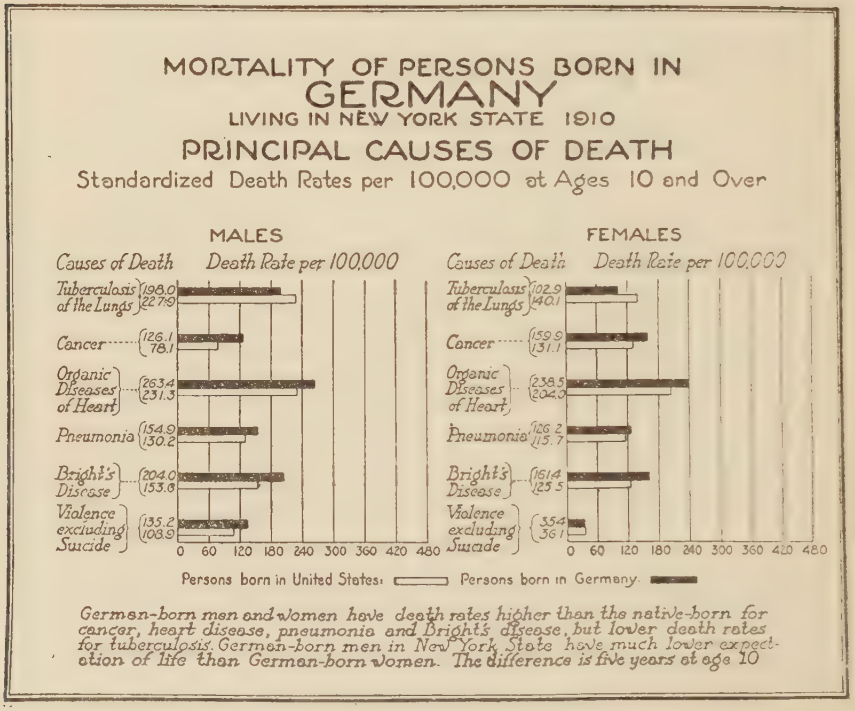

CHART 3

tuberculosis, German born men and women have higher death rates than the native born for all important causes of death. The so-called degenerative diseases play a very important part in their high mortality. Heart disease and Bright's disease both show excessive rates among males and females. Cancer is also much higher among them than in the native population. Suicide is also an important element, although not shown in the chart. The mortality characteristics of the German born living in New York State recall clearly similar facts for the native population of

Germany, but to an exaggerated degree. The mortality rates of Germans living in their native country have shown remarkable improvement during the decades prior to the war and were among the most favorable in Europe. Germans living in New York State, however, showed an expectation of life five years less at age ten and considerably higher death rates for the principal causes than are found for the Germans in their own country.

IRISH

The Irish living in New York State present a very serious situation from the standpoint of longevity. They form an important part of the population, representing in 1910, 13.5 per cent of the total foreign born and 4.1 per cent of the total white population of the state. The high point in the immigration of this race was reached long ago, so that today we must consider not only those who were born abroad but their native born children as well. The Irish stock in New York State thus considered, comprise 12.2 per cent of the total white population in 1910.

A very high death rate is coupled with the numerical importance of this race. The effect on the mortality conditions of the entire population is, therefore, considerable. As shown in Chart 1, the longevity as measured by the expectation of both Irish born males and females is least of any of the foreign stocks listed. Striking excesses of mortality exist. Thus, Irish males at the age period twenty-five to forty-four have a death rate of 18.5 per thousand, or nearly three times that for native males of native parentage (6.9 per thousand). Irish born females at the same age period show a rate of 12.0 per thousand much less than for Irish males, but nearly twice that of native females of native parentage. Taking all ages ten and over together and with due regard to the differences of age distribution, we find that the standardized death rates for both Irish males and females are about twice that for natives of native parentage.

The following chart shows that these results follow from an excessive mortality from every principal cause of death, but especially so from tuberculosis, pneumonia and violence.

It is difficult to understand these facts in view of the rather favorable mortality conditions of the Irish in their own country. The figures for those living in New York State are not far from twice as high as those reported by the Registrar General of Ireland for the more important age periods of life. The factors which produce these differences will justify further study.

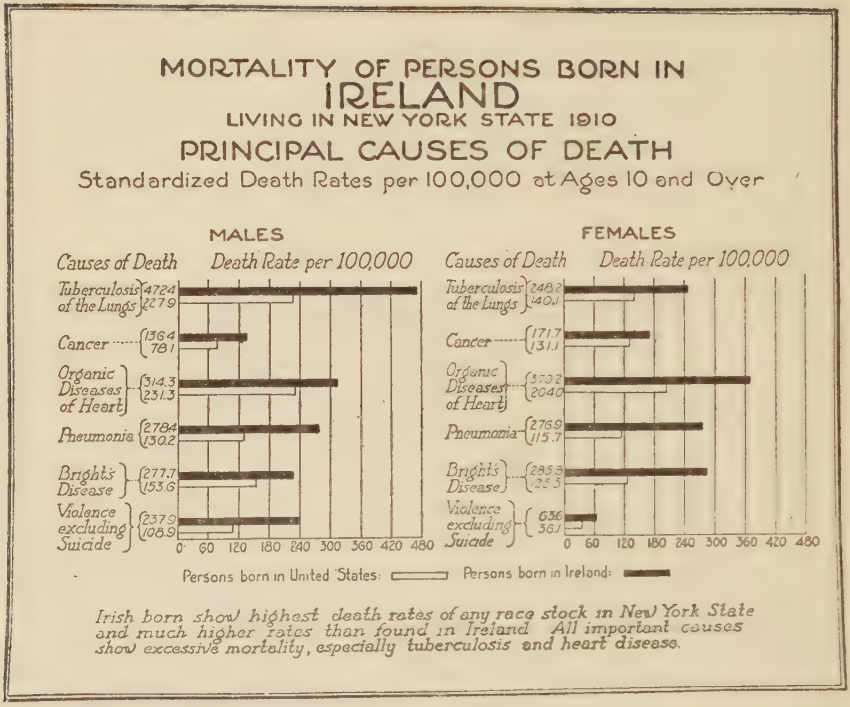

CHART 4

ITALIANS

The Italians have very favorable death rates in New York State and enjoy a good expectation. In this respect, the Italian born males show up relatively better than do the females. Among the males, we observe especially low rates for tuberculosis, cancer, heart disease and Bright's disease. On the other hand, they have higher death rates from pneumonia and violence, both of which may well reflect the hazards peculiar to their occupations.

Italian born females, unlike the males, have relatively high death rates from tuberculosis of the lungs and organic heart disease. Like the males, they have high pneumonia rates. The figures indicate that the conditions of life in New York State are not particularly favorable for Italian women in spite of a good endowment of bodily vigor.

It is important to note that in spite of the marked change in the environmental conditions in New York State as compared with their native country,

which, for the large majority of the Italian immigrants is the warm south, the Italian born live longer and suffer less from most serious diseases in their new abode than in their home country.

According to the 1910 census, the number of persons of Italian birth in New York State was 472,192. This was 17.3 per cent of the foreign born whites and 5.3 per cent of the total white population. This number is large in view of the recent date at which the Italian immigration began.

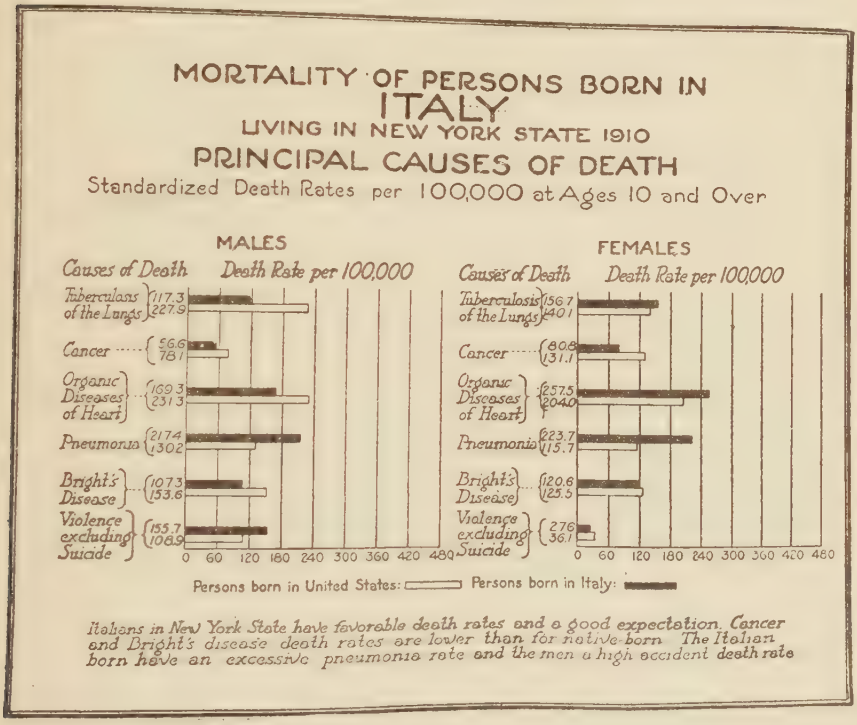
MORTALITY OF PERSONS BORN IN ITALY
LIVING IN NEW YORK STATE 1910
PRINCIPAL CAUSES OF DEATH
Standardized Death Rates per 100,000 at Ages 10 and Over
MALES
Causes of Death
Death Rate per 100,000
Tuberculosis of the Lungs 117.3 227.9
Cancer 56.6 78.7
Organic Diseases of Heart 169.3 231.3
Pneumonia 217.4 130.2
Bright's Disease 107.3 153.6
Violence excluding Suicide 155.7 106.9
0 60 120 180 240 300 360 420 480
FEMALES
Causes of Death
Death Rate per 100,000
Tuberculosis of the Lungs 156.7 140.1
Cancer 80.8 131.1
Organic Diseases of Heart 257.5 204.0
Pneumonia 223.7 115.7
Bright's Disease 120.6 125.5
Violence excluding Suicide 27.6 36.7
0 60 120 180 240 300 360 400 480
Persons born in United States:
Persons born in Italy:
Italians in New York State have favorable death rates and a good expectation. Cancer and Bright's disease death rates are lower than for native-born. The Italian born have an excessive pneumonia rate and the men a high accident death rate

CHART 5

A steady stream of this nativity may be expected to come to the United States. Their addition to the population from the point of view of longevity involves little, if any, loss to the total population.

RUSSIANS

The Russian born living in New York State form the largest group among the foreign stocks studied. In 1910, there were 558,952, or 20.5 per cent of the total foreign born and 6.2 per cent of the total white population.

Although no absolutely trustworthy figures are available, it is obvious that in New York State, the Russian born are, for the most part, Jews, and it is this fact that explains the very low death rate and greater longevity which the Russian born enjoy. As shown in Chart 1, both males and females of this race have an expectation as good as the native born of native parentage; in fact, the males are slightly better than the native stock. The full significance of this fact appears when we consider the very favorable conditions of life of this people in their new environment. They are, for the most part,

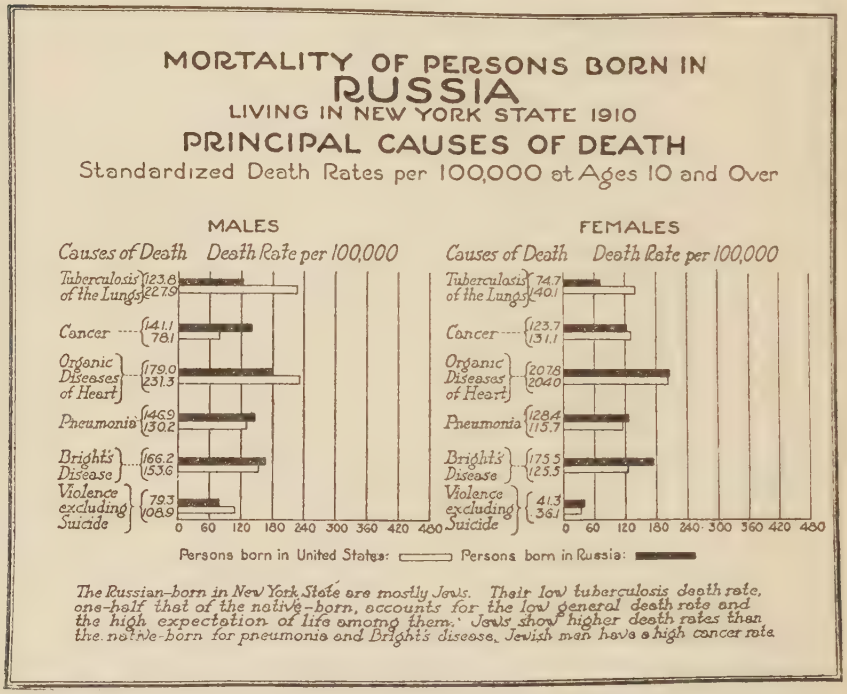

CHART 6

relatively newcomers, and many of them are still suffering from the difficulties arising out of poor housing and of bad economic status incidental to a period of adjustment in a new country. This fact again bears out what is generally known: that the Jews as a people have extraordinary vigor.

As shown in Chart 6, these Russian born in New York State have very much lower death rates from pulmonary tuberculosis than is found among the native born. In the age period twenty-five to forty-four, for example, males show a tuberculosis death rate of 117.1 per 100,000, as compared with

352.0 among natives. Females, likewise, at this same age period, show a tuberculosis death rate a little more than one-half that of the native born females. It is this favorable condition as to tuberculosis which almost by itself explains the favorable mortality which is observed in this race. On the other hand, Bright's disease is higher among these people, especially in the later age periods. Likewise cancer has an excessive death rate among males. The low death rate from violent causes points to the absence of hazard in their occupations.

SUMMARY AND CONCLUSION

We may, therefore, conclude that:

1. The several races that make up the foreign born population of New York are variable as to their natural vigor as measured by their mortality rates or by life tables.

2. With the exception of the Russians, who are, for the most part, Jews, the expectation of life of the foreign born is less than for the native born of native parentage.

3. Of the foreign born, Russians have the best expectation followed in order by the Italian, the English, Scotch and Welsh, the Germans, and the Irish. The last have a particularly low expectation.

4. With the exception of the Russians and Italians, the mortality is higher among these races living in New York State than in their native country.

5. This condition may be due to the difficulties of adjustment to new conditions of life or to the poorer quality of the immigrants as compared with their own people who stay at home or to a combination of both these factors.

RACE AMALGAMATION IN HAWAII

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It had been my intention to have considered in some detail the present and possible future results of race intermixture in Hawaii. In 1915 I made a reasonably thorough personal investigation into the facts, the preliminary results of which were incorporated in an address originally delivered before The Medical Society of Hawaii, but subsequently enlarged and brought down to date. This address, on "The Sanitary Progress and Vital Statistics of Hawaii," concludes with the statement that "The public health progress and the eradication and control of the more serious tropical and semi-tropical diseases reflect the highest achievements of American medicine, surgery, and sanitary science in active and effective coöperation with an intelligent, broad-minded, and generous people, strongly under the constructive influence of American ideals of good government and public welfare." This conclusion applies to all the various races which in their interrelation determine the ultimate destiny of this outlying possession of the United States. Possibly no equal area in the world presents more interesting racial aspects than the group of islands which constitute the Territory of Hawaii.

Against a diminution in population of from 130,313 in 1832 to 56,897 in 1872, there has been an increase in the number of inhabitants of from 57,985 in 1878 to 255,912 in 1920. No analysis in detail as regards the racial composition of this population in accordance with the last census is as yet available, but the discussion for the present purpose concerns an examination in detail of 22,388 decedents in the Territory of Hawaii during the period 1910–1915. Through the kindness of the Territorial Board of Health, and in coöperation with the Division of Vital Statistics, Bureau of the Census, a transcript of every death certificate registered during the period referred to was secured, stating the essential facts as to sex, race, birthplace of decedent's father, birthplace of decedent's mother, civil state, age, date of birth, occupation, primary and secondary cause of death, deaths of non-residents, deaths in institutions, etc. This information was transferred to cards and thus made available for mechanical analysis, so

that practically any combination of results can be worked out. For the present purpose it is only possible to consider very briefly the correlation of the father's birthplace and the mother's birthplace to the birthplace of the deceased. In other words, what were the parental origins, as far as available of those who died. It has seemed best to make the mother's birthplace the basis of the conclusions which follow. This was the principle approved of by the late Dr. John S. Billings in his Race Analysis of the Mortality of the Census of 1890.

Out of 20,631 decedents whose mothers' nativities were specified, 7442, or 36.07 per cent, had mothers who were born in Hawaii. The second most important racial element were the Japanese, 7269 being returned as having had mothers who were born in Japan. The third most important group were the Portuguese, 1597 decedents being reported as having had mothers who were born in Portugal. Fourth in the order of racial importance were the Chinese, there having been 1358 decedents whose mothers were born in China. These four elements constitute 85.63 per cent of the total number of decedents during the period under review. In the order of their importance, the following may be referred to: Decedents having had mothers who were born in the Philippine Islands, 944; in Porto Rico, 553; in Spain, 362; in the United States, 319; in Korea, 254; in Germany, 110. In all there were 41 countries specified, for each of which information in detail is given in the statistical appendix. (Appendix A—Birthplace of Mothers of 20,631 Decedents in the Territory of Hawaii, 1910–1915).

Considered by ages under fifteen, and fifteen and over, with a due regard to sex, the proportionate distribution of decedents varies considerably. This aspect is of importance, but cannot be enlarged upon on this occasion. Of the 20,631 decedents whose mothers' birthplaces were specified, 12,064 were males and 8567 females. Of the males, 5667, or 47.0 per cent, were under fifteen years of age, while of the females, 4779, or 55.8 per cent, were under fifteen years of age. The sex disparity is particularly pronounced in the case of decedents having had Chinese mothers, there having been 914 deaths of males ages fifteen and over, against only 110 females. Of decedents having had mothers who were born in Hawaii there were 1883 males for this period of life and 1872 females. Even more suggestive is the sex disparity in the case of decedents having had mothers who were born in the Philippine Islands, there having been 401 males fifteen years of age and over against only 62 females. These differences in sex distribution naturally bear upon the more complex question of mortality and disease liability.

The question with which the present discussion is concerned, however, is the extent to which the population of Hawaii is the result of race intermixture, which is hardly equivalent to race amalgamation. It requires to be said, however, that in Hawaii most of the race intermingling is on the basis of lawful marriage, much as this is the case with our native Indians, while a glaring contrast is presented by the offspring of illicit sex relations between white men and negro women.

Table B of the appendix shows the fundamental facts of the nativities of the parents. Limiting the discussion, of necessity, to the predominating racial elements, the first requiring consideration are decedents whose fathers had been born in China. According to the table there were 1690 such decedents, 1324 of whom, or 78.3 per cent, had mothers who were also born in China. The race intermixture in this case is practically concentrated upon mothers born in Hawaii, there having been 350 deaths in this group, or 20.7 per cent of the total. Recalling that 41 countries are represented in the fundamental table (Appendix A), it is significant that in the case of the fathers born in China the intermingling should only have concerned 9 specified other countries, given as Gilbert Islands, 1; Japan, 4; Korea, 1; Porto Rico, 5; Portugal, 2; Russia, 1; Spain, 1; United States, 1. Since the Chinese have been settled in the Hawaiian Islands for more than fifty years, this analysis would not seem to indicate any particular tendency towards general racial amalgamation, excepting in the case of women of native Hawaiian stock.

Next to the Americans, no other racial element has been longer in the Islands or been more influential in the social, economic and racial relations than the English. Yet there were only 144 deaths of persons whose fathers had been born in England and whose mothers had been born in 10 other countries, or, respectively, aside from 70 mothers, or 48.6 per cent born in England, as follows: Africa, 1; Canada, 1; Germany, 1; Hawaii, 53; Ireland, 1; Portugal, 3; Scotland, 6; Tahiti, 1; United States, 5; Wales, 2. Here again the predominating tendency is towards intermixture with women of native Hawaiian stock, representing 36.8 per cent of the mortality.

The next important group concerns the offspring of fathers born in Germany, of which there were 160. Of these, 102 had mothers who were also born in Germany, or 63.8 per cent of the total. In addition, there were 45 decedents whose mothers were of native Hawaiian stock, representing 28.1 per cent of the whole. Of the remainder, 3 had mothers who were born in England; 1 in Mexico; 4 in Portugal; 1 in Samoa; and 4 in the United States.

As said before, the predominating local origin of the population is Hawaiian, or 6563 decedents whose fathers had been born in Hawaii, of whom 6446 also had mothers who were born in Hawaii. This is by far the most interesting racial element as regards possible tendencies toward race amalgamation. As previously emphasized in the case of decedents having had Chinese fathers, the proportion having had Hawaiian mothers was 20.7 per cent; English fathers and Hawaiian mothers 36.8 per cent; and German fathers and Hawaiian mothers 28.1 per cent. It is, therefore, highly significant that of the proportion having had fathers who were born in Hawaii, 98.2 per cent should also have had mothers who were born in Hawaii. The remainder concerns 16 other racial types, as follows: Brazil, 1; Chili, 1; China, 33; England, 1; Germany, 1; Gilbert Islands, 1; Japan, 5; Korea, 1; New Zealand, 1; Norway, 1; Porto Rico, 3; Portugal, 48; Samoa, 1; Spain, 3; Tahiti, 3; United States, 13.

The foregoing would seem to justify the conclusion that native-born Hawaiian males have no serious difficulty in securing women of other nativities, and that they do so to a more varied extent than any other component part of the Hawaiian population. Of interest are the returns for decedents having had fathers who were born in Ireland, of which there were 49; 33 of whom, or 67.3 per cent, also had mothers who were born in Ireland, while 10 had mothers who were born in Hawaii and 6 in the United States. The Japanese element, which within recent years has assumed such a predominating numerical importance in the total population, shows no tendency towards a particular degree of racial intermixture. There were 7330 deaths of persons having had Japanese fathers, and of this number 7260, or 99.0 per cent, also had Japanese mothers. The number having had Hawaiian mothers was only 64, or 0.9 per cent, while of the remainder 1 had a mother born in Brazil; 2 in Korea; 2 in Porto Rico; and 1 in Portugal. In other words, there were only 5 countries intermingled with 7330 decedents having had Japanese fathers, while there were 9 countries intermingled with 1690 decedents having had Chinese fathers. The Japanese, therefore, may safely be considered as showing a decidedly lesser inclination to race amalgamation than any other important racial elements.

There were 261 deaths of persons having had Korean fathers, 250 of whom also had Korean mothers; 9 had mothers who were born in Hawaii; 1 in the Philippine Islands, and 1 in Spain. There were 47 deaths of persons having had Norwegian fathers, of whom 31, or 66.0 per cent also had mothers who were born in Norway; 9 had mothers who were born in Hawaii; 2 in Germany; 1 in Portugal; 3 in the United States; and 1 in the West Indies. The results for Norway may be contrasted with about the same number

of returns for Ireland, the latter showing a lesser tendency towards race amalgamation.

The Filipino element is of comparatively recent introduction on the Islands, and of the 966 deaths of persons having had Filipino fathers, 942, or 97.5 per cent, also had mothers who were born in the Philippine Islands. Of the remainder, 21 had mothers who were born in Hawaii; 2 in Porto Rico; and 1 in Spain.

Until the advent of the Japanese, one of the most important racial elements in Hawaii was the Portuguese. They have long been settled in the Islands, contract immigration having been fostered during the royal rule, when special efforts were made to attract an energetic labor element. The Portuguese of today hold an important social and political position on the Islands, but the results show a comparatively slight inclination towards race intermixture. Out of 1775 deaths of persons having had fathers who were born in Portugal, 1524, or 85.8 per cent, also had Portuguese mothers. In addition, 242, or 13.5 per cent, had mothers who were born in Hawaii. Among the remainder of the 6 intermingled nativities, 3 had mothers who were born in Brazil; 1 in Germany; 3 in Porto Rico; 1 in Spain; and 1 in the United States.

The number of decedents having had fathers who were born in Scotland was 65, and of this number 43, or 66.1 per cent, also had Scotch mothers. There were 12 whose mothers had been born in Hawaii, while of the remainder 1 had a mother who was born in Australia; 2 in England; 2 in Ireland; 4 in the United States; and 1 in Wales. It is significant that the fathers of these decedents should have intermingled with 6 other nativities, while the Irish fathers of 49 decedents intermingled with only 2 other racial stocks.

Next to the Portuguese, previous to the advent of the Orientals, an important local element was of Spanish ancestry. There were 370 deaths of persons whose fathers had been born in Spain and of this number 352, or 95.1 per cent, had mothers of Spanish descent. Of the remainder, 1 had a mother who was born in Germany; 1 in Guam; 14 in Hawaii; 1 in the Philippine Islands; and 1 in Porto Rico.

A rather curious result is shown by the data for persons having had fathers who were born in Switzerland, all but 1 of whom had mothers who were born in some other country; 1 having been born in Germany; 1 in Hawaii; 1 in Portugal; and 1 in the United States. Of course in such a case as this, which is also true of certain other nativities, particularly Scandinavian, any possible marriage must needs follow unlike racial lines on account of the fact that most of the immigration was on the male side.

There only remains to refer briefly to the decedents whose fathers had been born in the United States. There were 409 in this group, of whom 273, or 66.8 per cent, also had mothers who were born in the United States, while 115, or 28.2 per cent, had mothers who were born in Hawaii. The remainder concerned 10 other racial stocks, as follows: Australia, 2; Canada, 3; China, 1; Ireland, 1; Norway, 1; Porto Rico, 3; Portugal, 7; Scotland, 1; Spain, 1; Tahiti, 1.

The term "racial stock" is, of course, used here in a very broad sense. The birthplace is not necessarily the equivalent of racial origins. Those born in Hawaii are not necessarily, or at all for that matter, of Hawaiian ancestry, but for the present purpose no other phase of the analysis would seem more likely to offer reasonably conclusive results.

The foregoing analysis would justify different conclusions if a division had been made as to sex and age, or whether under fifteen, or fifteen years of age and over. A single illustration will emphasize the importance of the age factor, which cannot be enlarged upon on this occasion. Among the 409 decedents whose fathers had been born in the United States, 28.2 per cent had mothers who were born in Hawaii, but of male decedents under fifteen years of age the proportion was 51.9 per cent, while at ages fifteen and over the proportion was 13.5 per cent. For females under fifteen years of age the proportion having had Hawaiian-born mothers was 52.7 per cent, while at ages fifteen and over the proportion was 21.5 per cent.

It had been my intention to have considered this analysis in detail, with particular reference to the cause of death, possibly suggestive of inherent disease immunity or disease predisposition. The most important cause of death on the Islands, particularly as regards the native-born element, is tuberculosis. Selecting for the present purpose the decedents according to the birthplace of the mother, and limiting the consideration to ages twenty to forty-nine, it appears that for both sexes combined the proportion of deaths from tuberculosis among persons having had mothers who were born in China was 31.1 per cent; mothers born in Hawaii, 28.1 per cent; mothers born in Japan, 17.7 per cent; mothers born in Korea, 33.6 per cent; mothers born in the Philippine Islands, 21.5 per cent; mothers born in Porto Rico, 31.1 per cent; mothers born in Portugal, 21.4 per cent; mothers born in Spain, 21.7 per cent; and for all decedents combined the proportion was 21.0 per cent. These differences are not as pronounced as has often been assumed to be the case. Unfortunately the numbers are hardly sufficient to extend the analysis in correlation to the birthplace of the decedent's fathers. It is my intention, however, on some future occasion, to present the facts more in detail (Appendix C).

For the present purpose it would seem sufficient to have emphasized the conclusions that racial intermixture in the Hawaiian Islands is much more restricted than is generally assumed to be the case. It is furthermore shown that the racial amalgamation which does take place follows by preference the line of intermingling with native-born Hawaiian women or with people of a similar racial affiliation, in conformity with what Westermarck has called the law of similarity. As a matter of convenience, however, I may recapitulate the results showing the proportion having like racial origins, or, in other words, where the father and mother were both born in the same country. This for the Chinese was 78.3 per cent; for the English, 48.6 per cent; for the Hawaiians, 98.2 per cent; for the Japanese, 99.0 per cent; for the Filipinos, 97.5 per cent; for the Portuguese, 85.8 per cent; and for the Americans, 66.8 per cent. These are the results for races which are apparently of sufficient numerical importance to justify fairly safe conclusions.

In brief, the available data indicate nothing very startling or that would be suggestive of promiscuous racial intermixture, or the breaking down of the social barriers which keep separate the different races, otherwise peculiarly suggestive of unrestricted race amalgamation. There is probably nowhere in the world a lesser amount of racial strife and antagonism, so that the non-intermixture or non-intermarriage is governed by the higher law of racial similarity rather than by political or economic advantage. Both of these factors, however, figure conspicuously in the preference which all foreigners show (when they intermarry at all with other races) for women of native Hawaiian origin.

APPENDIX A

Birthplace of mothers of 20,631 decedents in the territory of Hawaii, 1910–1915

	TOTAL		MALES 0–14		MALES 15 AND OVER		FEMALES 0–14		FEMALES 15 AND OVER	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Total specified....	20,631	100.0	5,667	100.0	6,397	100.0	4,779	100.0	3,788	100.0
Africa.....	1	0.005							1	0.03
Australia.....	5	0.024			3	0.05			2	0.05
Austria.....	12	0.058	1	0.02	8	0.13	2	0.04	1	0.03
Brazil.....	5	0.024	2	0.04			3	0.06		
Canada.....	18	0.087	2	0.04	12	0.19	1	0.02	3	0.08
Chili.....	3	0.015			2	0.03	1	0.02		
China.....	1,358	6.582	206	3.63	914	14.28	128	2.68	110	2.90
Cuba.....	1	0.005			1	0.02				
Denmark.....	4	0.019			3	0.05	1	0.02		
England.....	77	0.373	2	0.04	48	0.75	1	0.02	26	0.69
Fiji Islands.....	2	0.010			2	0.03				
France.....	6	0.029			4	0.06			2	0.05
Germany.....	110	0.533	3	0.05	73	1.14	6	0.13	28	0.74
Gilbert Islands...	3	0.015	1	0.02	1	0.02			1	0.03
Guam.....	6	0.029			5	0.08			1	0.03
Hawaii.....	7,442	36.072	2,005	35.37	1,883	29.43	1,682	35.21	1,872	49.42
Ireland.....	39	0.189	2	0.04	28	0.44			9	0.24
Italy.....	3	0.015			3	0.05				
Japan.....	7,269	35.333	2,278	40.19	1,930	30.16	1,997	41.79	1,064	28.08
Korea.....	254	1.231	36	0.64	160	2.50	37	0.77	21	0.55
Mexico.....	5	0.024			2	0.03	3	0.06		
New Hebrides...	3	0.015			3	0.05				
New Zealand.....	2	0.010			1	0.02			1	0.03
Norway.....	33	0.160	2	0.04	25	0.39	1	0.02	5	0.13
Philippine Islands.....	944	4.576	269	4.74	401	6.27	212	4.44	62	1.64
Poland.....	1	0.005					1	0.02		
Porto Rico.....	553	2.681	188	3.32	112	1.75	167	3.49	86	2.27
Portugal.....	1,597	7.741	443	7.81	475	7.42	347	7.26	332	8.76
Russia.....	95	0.460	32	0.56	25	0.39	30	0.63	8	0.21
Samoa.....	5	0.024	1	0.02	2	0.03			2	0.05
Scotland.....	50	0.242			36	0.56	3	0.06	11	0.29
Solomon Islands..	2	0.010			2	0.03				
South Sea Islands	9	0.044			6	0.09			3	0.08
Spain.....	362	1.755	145	2.56	53	0.83	123	2.57	41	1.08
Sweden.....	13	0.063			11	0.17			2	0.05
Switzerland.....	1	0.005			1	0.02				
Syria.....	1	0.005			1	0.02				
Tahiti.....	10	0.048	1	0.02	6	0.09			3	0.08
United States....	319	1.546	48	0.85	149	2.33	32	0.67	90	2.38
Wales.....	4	0.019			3	0.05			1	0.03
West Indies.....	4	0.019			3	0.05	1	0.02		

APPENDIX B

Birthplace of parents of decedents in Hawaii—1910–1915, arranged in the order of the fathers' birthplace

BIRTHPLACE OF		TOTAL		MALES 0–14		MALES 15 AND OVER		FEMALES 0–14		FEMALES 15 AND OVER	
Father	Mother	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Africa		1	100.0							1	100.0
	Portugal	1	100.0							1	100.0
Australia		3	100.0	1	100.0	1	100.0			1	100.0
	Australia	2	66.7			1	100.0			1	100.0
	Hawaii	1	33.3	1	100.0						
Austria		16	100.0	3	100.0	9	100.0	3	100.0	1	100.0
	Austria	12	75.0	1	33.3	8	88.9	2	66.7	1	100.0
	Germany	1	6.3			1	11.1				
	Hawaii	3	18.7	2	66.7			1	33.3		
Brazil		1	100.0					1	100.0		
	Hawaii	1	100.0					1	100.0		
Canada		23	100.0	4	100.0	11	100.0	2	100.0	6	100.0
	Canada	14	60.9	1	25.0	10	90.9	1	50.0	2	33.3
	Hawaii	2	8.7							2	33.3
	Ireland	2	8.7	1	25.0					1	16.7
	United States	4	17.4	2	50.0			1	50.0	1	16.7
	Wales	1	4.3			1	9.1				
Ceylon		1	100.0	1	100.0						
	United States	1	100.0	1	100.0						

Chili		3	100.0			3	100 0				
	Chili	2	66.7			2	66.7				
	United States	1	33.3			1	33.3				
China		1690	100.0	346	100.0	956	100.0	231	100.0	157	100.0
	China	1324	78.3	188	54.3	913	95.5	115	49.8	108	68.8
	Gilbert Islands	1	0.1							1	0.6
	Hawaii	350	20.7	154	44.5	43	4.5	106	45.9	47	30.0
	Japan	4	0.2	1	0 3			3	1.3		
	Korea	1	0.1					1	0.4		
	Porto Rico	5	0.2	1	0 3			4	1.8		
	Portugal	2	0.1					1	0.4	1	0.6
	Russia	1	0.1					1	0.4		
	Spain	1	0.1	1	0.3						
	United States	1	0.1	1	0.3						
Cuba		3	100.0			2	100.0	1	100.0		
	Cuba	1	33.3			1	50.0				
	Hawaii	1	33.3			1	50.0				
	Portugal	1	33.3					1	100.0		
Denmark		6	100.0	1	100.0	4	100.0	1	100.0		
	Denmark	4	66.6			3	75.0	1	100.0		
	Hawaii	1	16.7	1	100 0						
	Portugal	1	16.7			1	25.0				
England		144	100.0	9	100.0	79	100.0	7	100.0	49	100.0
	Africa	1	0.7							1	2.05
	Canada	1	0.7			1	1.3				
	England	70	48.6			45	57.0			25	51.0

APPENDIX B—*Continued*

BIRTHPLACE OF		TOTAL		MALES 0–14		MALES 15 AND OVER		FEMALES 0–14		FEMALES 15 AND OVER	
Father	Mother	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
England—Con.											
	Germany	1	0.7							1	2.05
	Hawaii	53	36.8	6	66.7	24	30.3	5	71.4	18	36.7
	Ireland	1	0.7							1	2.05
	Portugal	3	2.1	2	22.2			1	14.3		
	Scotland	6	4.2			3	3.8	1	14.3	2	4.1
	Tahiti	1	0.7			1	1.3				
	United States	5	3.5	1	11.1	4	5.0				
	Wales	2	1.3			1	1.3			1	2.05
Fanning Isles		1	100.0	1	100.0						
	Hawaii	1	100.0	1	100.0						
Fiji Islands		3	100.0	1	100.0	2	100.0				
	Fiji Islands	2	66.7			2	100.0				
	Hawaii	1	33.3	1	100.0						
France		8	100.0			5	100.0			3	100.0
	France	6	75.0			4	80.0			2	66.7
	Hawaii	2	25.0			1	20.0			1	33.3
Germany		160	100.0	24	100.0	82	100.0	17	100.0	37	100.0
	England	3	1.9	1	4.2	1	1.2			1	2.7
	Germany	102	63.8	1	4.2	70	85.4	5	29.4	26	70.3
	Hawaii	45	28.1	17	70.8	9	11.0	10	58.8	9	24.3
	Mexico	1	0.6					1	5.9		
	Portugal	4	2.5	2	8.3	1	1.2	1	5.9		
	Samoa	1	0.6							1	2.7
	United States	4	2.5	3	12.5	1	1.2				

Gilbert Islands		4	100.0	2	100.0	1	100.0	1	100.0		
	Gilbert Islands	1	25.0			1	100.0				
	Hawaii	3	75.0	2	100.0			1	100.0		
Guam		12	100.0	1	100.0	6	100.0	4	100.0	1	100.0
	Guam	5	41.7			4	66.7			1	100.0
	Hawaii	6	50.0	1	100.0	2	33.3	3	75.0		
	United States	1	8.3					1	25.0		
Hawaii		6563	100.0	1650	100.0	1756	100.0	1417	100.0	1740	100.0
	Brazil	1	0.02					1	0.1		
	Chili	1	0.02					1	0.1		
	China	33	0.5	18	1.0	1	0.1	12	0.8	2	0.1
	England	1	0.02					1	0.1		
	Germany	1	0.02			1	0.1				
	Gilbert Islands	1	0.02	1	0.1						
	Hawaii	6446	98.2	1594	96.6	1751	99.5	1366	96.4	1735	99.75
	Japan	5	0.1	4	0.2			1	0.1		
	Korea	1	0.02			1	0.1				
	New Zealand	1	0.02			1	0.1				
	Norway	1	0.02					1	0.1		
	Porto Rico	3	0.1					3	0.2		
	Portugal	48	0.7	23	1.4			24	1.7	1	0.05
	Samoa	1	0.02	1	0.1						
	Spain	3	0.1	1	0.1			2	0.1		
	Tahiti	3	0.1	1	0.1	1	0.1			1	0.05
	United States	13	0.2	7	0.4			5	0.3	1	0.05
Ireland		49	100.0	5	100.0	29	100.0	1	100.0	14	100.0
	Hawaii	10	20.4	3	60.0	3	10.3	1	100.0	3	21.4
	Ireland	33	67.3	1	20.0	25	86.2			7	50.0
	United States	6	12.3	1	20.0	1	3.5			4	28.6

APPENDIX B—*Continued*

BIRTHPLACE OF		TOTAL		MALES 0–14		MALES 15 AND OVER		FEMALES 0–14		FEMALES 15 AND OVER	
Father	Mother	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Italy		7	100.0			5	100.0	2	100.0		
	Hawaii	3	42.9			1	20.0	2	100.0		
	Italy	3	42.9			3	60.0				
	Portugal	1	14.2			1	20.0				
Japan		7330	100.0	2311	100.0	1932	100.0	2020	100.0	1067	100.0
	Brazil	1	0.02	1	0.04						
	Hawaii	64	0.9	33	1.4	2	0.1	26	1.25	3	0.3
	Japan	7260	99.0	2273	98.4	1930	99.9	1993	98.7	1064	99.7
	Korea	2	0.03	1	0.04			1	0.05		
	Porto Rico	2	0.03	2	0.08						
	Portugal	1	0.02	1	0.04						
Korea		261	100.0	42	100.0	159	100.0	39	100.0	21	100.0
	Hawaii	9	3.4	5	11.9			4	10.3		
	Korea	250	95.8	35	83.3	159	100.0	35	89.7	21	100.0
	Philippine Islands	1	0.4	1	2.4						
	Spain	1	0.4	1	2.4						
Mexico		4	100.0			2	100.0	2	100.0		
	Mexico	4	100.0			2	100.0	2	100.0		
New Hebrides		3	100.0			3	100.0				
	New Hebrides	3	100.0			3	100.0				
New Zealand		4	100.0	1	100.0			2	100.0	1	100.0
	Hawaii	2	50.0					2	100.0		
	New Zealand	1	25.0							1	100.0
	United States	1	25.0	1	100.0						

Norway		47	100.0	2	100.0	27	100.0	12	100.0	6	100.0
	Germany	2	4.3					1	8.3	1	16.7
	Hawaii	9	19.1	1	50.0	2	7.4	6	50.0		
	Norway	31	66.0	1	50.0	25	92.6			5	83.3
	Portugal	1	2.1					1	8.3		
	United States	3	6.4					3	25.0		
	West Indies	1	2.1					1	8.3		
Philippine Islands		966	100.0	284	100.0	402	100.0	217	100.0	63	100.0
	Hawaii	21	2.2	14	4.9	1	0.2	5	2.3	1	1.6
	Philippine Islands	942	97.5	268	94.3	401	99.8	211	97.2	62	98.4
	Porto Rico	2	0.2	1	0.4			1	0.5		
	Spain	1	0.1	1	0.4						
Poland		1	100.0					1	100.0		
	Poland	1	100.0					1	100.0		
Porto Rico		545	100.0	185	100.0	109	100.0	165	100.0	86	100.0
	Hawaii	9	1.7	3	1.6			6	3.6		
	Porto Rico	533	97.8	180	97.3	109	100.0	158	95.8	86	100.0
	Portugal	1	0.2					1	0.6		
	Spain	2	0.3	2	1.1						
Portugal		1775	100.0	529	100.0	487	100.0	415	100.0	344	100.0
	Brazil	3	0.2	1	0.2			2	0.5		
	Germany	1	0.1	1	0.2						
	Hawaii	242	13.5	113	21.3	14	2.9	99	23.9	16	4.7
	Porto Rico	3	0.2	2	0.4	1	0.2				
	Portugal	1524	85.8	410	77.5	472	96.9	314	75.6	328	95.3
	Spain	1	0.1	1	0.2						
	United States	1	0.1	1	0.2						

APPENDIX B—*Continued*

BIRTHPLACE OF		TOTAL		MALES 0–14		MALES 15 AND OVER		FEMALES 0–14		FEMALES 15 AND OVER	
Father	Mother	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Russia		94	100.0	32	100.0	25	100.0	29	100.0	8	100.0
	Russia	94	100.0	32	100.0	25	100.0	29	100.0	8	100.0
Samoa		4	100.0			2	100.0			2	100.0
	Hawaii	1	25.0							1	50.0
	Samoa	3	75.0			2	100.0			1	50.0
Scotland		65	100.0	6	100.0	39	100.0	5	100.0	15	100.0
	Australia	1	1.5			1	2.6				
	England	2	3.1	1	16.7	1	2.6				
	Hawaii	12	18.5	4	66.6	2	5.1	2	40.0	4	26.7
	Ireland	2	3.1			2	5.1				
	Scotland	43	66.1			32	82.0	2	40.0	9	60.0
	United States	4	6.2	1	16.7			1	20.0	2	13.3
	Wales	1	1.5			1	2.6				
Solomon Islands		2	100.0			2	100.0				
	Solomon Islands	2	100.0			2	100.0				
South Sea Islands		12	100.0	2	100.0	6	100.0	1	100.0	3	100.0
	Hawaii	3	25.0	2	100.0			1	100.0		
	South Sea Islands	9	75.0			6	100.0			3	100.0
Spain		370	100.0	140	100.0	58	100.0	125	100.0	47	100.0
	Germany	1	0.3			1	1.7				
	Guam	1	0.3			1	1.7				

Spain—Con.											
	Hawaii	14	3.7	3	2.1	2	3.5	3	2.4	6	12.8
	Philippine Islands	1	0.3					1	0.8		
	Porto Rico	1	0.3			1	1.7				
	Spain	352	95.1	137	97.9	53	91.4	121	96.8	41	87.2
Sweden		16	100.0	2	100.0	11	100.0	1	100.0	2	100.0
	Hawaii	3	18.8	2	100.0			1	100.0		
	Sweden	13	81.2			11	100.0			2	100.0
Switzerland		5	100.0	2	100.0	1	100.0	1	100.0	1	100.0
	Germany	1	20.0	1	50.0						
	Hawaii	1	20.0					1	100.0		
	Portugal	1	20.0							1	100.0
	Switzerland	1	20.0			1	100.0				
	United States	1	20.0	1	50.0						
Syria		3	100.0	2	100.0	1	100.0				
	Hawaii	2	66.7	2	100.0						
	Syria	1	33.3			1	100.0				
Tahiti		10	100.0			4	100.0	1	100.0	5	100.0
	Hawaii	5	50.0			1	25.0	1	100.0	3	60.0
	Tahiti	5	50.0			3	75.0			2	40.0
United States		409	100.0	77	100.0	170	100.0	55	100.0	107	100.0
	Australia	2	0.5			1	0.6			1	0.9
	Canada	3	0.8	1	1.3	1	0.6			1	0.9
	China	1	0.2					1	1.8		
	Hawaii	115	28.2	40	51.9	23	13.5	29	52.7	23	21.5

APPENDIX B—*Concluded*

BIRTHPLACE OF		TOTAL		MALES 0–14		MALES 15 AND OVER		FEMALES 0–14		FEMALES 15 AND OVER	
Father	Mother	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
United States—Con.											
	Ireland	1	0.2			1	0.6				
	Norway	1	0.2	1	1.3						
	Porto Rico	3	0.8	2	2.6			1	1.8		
	Portugal	7	1.7	4	5.2			3	5.5		
	Scotland	1	0.2			1	0.6				
	Spain	1	0.2	1	1.3						
	Tahiti	1	0.2			1	0.6				
	United States	273	66.8	28	36.4	142	83.5	21	38.2	82	76.7
West Indies		7	100.0	1	100.0	6	100.0				
	England	1	14.3			1	16.7				
	Hawaii	1	14.3			1	16.7				
	Porto Rico	1	14.3			1	16.7				
	Portugal	1	14.3	1	100.0						
	West Indies	3	42.8			3	50.0				

APPENDIX C

Mortality in Hawaii—1910–1915; Proportionate mortality from tuberculosis of lungs according to mothers' birthplace

AGES AT DEATH	PERSONS			MALES			FEMALES		
	All causes	Tuberculosis of lungs	Per cent	All causes	Tuberculosis of lungs	Per cent	All causes	Tuberculosis of lungs	Per cent
Mother born in China									
Under 20	362	16	4.4	220	7	3.2	142	9	6.3
20–49	437	136	31.1	369	116	31.4	68	20	29.4
50 and over	560	54	9.6	532	49	9.2	28	5	17.9
All ages	1,359	206	15.2	1,121	172	15.3	238	34	14.3
Mother born in Hawaii									
Under 20	1,876	142	7.6	1,007	64	6.4	869	78	9.0
20–49	928	261	28.1	418	98	23.4	510	163	32.0
50 and over	973	48	4.9	555	31	5.6	418	17	4.1
All ages	3,777	451	11.9	1,980	193	9.7	1,797	258	14.4
Mother born in Japan									
Under 20	4,434	104	2.3	2,354	31	1.3	2,080	73	3.5
20–49	2,360	417	17.7	1,440	231	16.0	920	186	20.2
50 and over	479	48	10.0	419	39	9.3	60	9	15.0
All ages	7,273	569	7.8	4,213	301	7.1	3,060	268	8.8
Mother born in Korea									
Under 20	78	1	1.3	37			41	1	2.4
20–49	149	50	33.6	138	47	34.1	11	3	27.3
50 and over	27	4	14.8	22	4	18.2	5		
All ages	254	55	21.7	197	51	25.9	57	4	7.0
Mother born in Philippine Islands									
Under 20	537	8	1.5	316	5	1.6	221	3	1.4
20–49	381	82	21.5	328	68	20.7	53	14	26.4
50 and over	26	4	15.4	26	4	15.4			
All ages	944	94	10.0	670	77	11.5	274	17	6.2
Mother born in Porto Rico									
Under 20	372	6	1.6	195	2	1.0	177	4	2.3
20–49	135	42	31.1	68	26	38.2	67	16	23.9
50 and over	46	1	2.2	37	1	2.7	9		
All ages	553	49	8.9	300	29	9.7	253	20	7.9

APPENDIX C—*Concluded*

AGES AT DEATH	PERSONS			MALES			FEMALES		
	All causes	Tuberculosis of lungs	Per cent	All causes	Tuberculosis of lungs	Per cent	All causes	Tuberculosis of lungs	Per cent
Mother born in Portugal									
Under 20	828	14	1.7	463	5	1.1	365	9	2.5
20–49	309	66	21.4	152	32	21.1	157	34	21.7
50 and over	463	22	4.8	305	17	5.6	158	5	3.2
All ages	1,600	102	6.4	920	54	5.9	680	48	7.1
Mother born in Spain									
Under 20	276	9	3.3	151	1	0.7	125	8	6.4
20–49	60	13	21.7	29	4	13.8	31	9	29.0
50 and over	26	3	11.5	18	3	16.7	8		
All ages	362	25	6.9	198	8	4.0	164	17	10.4
Summary of all decedents									
Under 20	11,410	389	3.4	6,182	194	3.1	5,228	195	3.7
20–49	6,638	1,396	21.0	4,074	840	20.6	2,564	556	21.7
50 and over	4,340	259	6.0	3,010	203	6.7	1,330	56	4.2
All ages	22,388	2,044	9.1	13,266	1,237	9.3	9,122	807	8.8

SOME RESULTS OF RACE MIXTURE IN HAWAII

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The investigation of which this paper is a preliminary and partial report, was planned in 1916 by Dr. Tozzer and Dr. Hooton. Its original objects were to secure accurate anthropometric data on the pure (native) Hawaiians and on the hybrids between them and other races in the Hawaiian Islands, to trace if possible the inheritance of the physical characters entering the crosses and to determine in a general way the results of hybridization among such races and under such conditions as obtain in Hawaii. It was thought that an adequate treatment of these data for the objects sought should involve a statistical study from the point of view of the geneticist and it devolved upon the present writer to fulfill this function. The collection of the data was undertaken by Dr. Tozzer who spent the summers of 1916 and 1920 in Hawaii and obtained observations on some 508 subjects, chiefly in and about Honolulu.

The measurements and observations were made in accordance with the current International agreement, and were recorded on schedules designed by Dr. Hooton. Race and parentage were determined from information supplied by the subject, verified wherever possible by other records and by the knowledge and judgment of the observer. Our data on this last point probably contain some errors, since occasional individuals reporting themselves as of one race or pedigree have been found on analysis to have traits outside of the normal range of variation for the race or type. All such doubtful cases have been omitted from our calculations and summary.

The classification by race or mixture of all of the subjects measured is given in table 1. As a whole this cannot be regarded as a random sample of the population of Hawaii, and there was no intention that it should be. The intention of the observer was on the other hand to observe as many as possible of the pure native Hawaiians, and of persons of mixed Hawaiian and foreign blood; and to measure only a small sample of other pure races chiefly for comparison with the hybrids. As regards the Hawaiian hybrids considered alone, however, it is likely that a representative assortment was secured, since all available persons who had any Hawaiian blood were meas-

ured. Considering only the hybrids involving Hawaiian, then, the table gives a good picture of what is taking place in Hawaii. Hybrids between Hawaiians and a number of races of each of the three great stocks of mankind are being formed. The relative frequency of crosses between the Hawaiians and other races may be inferred roughly from the frequency of hybrids involving the various races. Thus it is found that the production of the 294 subjects of mixed Hawaiian blood probably involved some 344

TABLE 1

Racial classification of the subjects

A. PURE RACES		B. HAWAIIAN—"WHITE"* HYBRIDS		C. HAWAIIAN—CHINESE HYBRIDS	
Hawaiian	158	F_1	36	F_1	28
Chinese	23	F_2	32	F_2	6
Portuguese	9	Backcross × Hawaiian	38	Backcross × Hawaiian	28
Japanese	8	Backcross × White	23	Backcross × Chinese	5
Korean	4	Other mixtures	21	Other mixtures	8
Philipino	2				
Totals	204		150		75

D. F_1 HAWAIIAN		E. TRI-RACIAL HYBRIDS		F. MULTIPLE AND OTHER HYBRIDS		TOTAL
Negro	5	Haw. Chinese White	29	Haw. Port.‡ Tahitian White	1	
Japanese	4	Haw. Indian White	4	Haw. Chinese Negro White	1	
Samoan	3	Haw. Malay White	2	Haw. Indian Japanese White	1	
Philipino	1	Haw. Japanese White	2	Part Hawaiian	7	
Indian	1	Haw. (other)† White	7	Non-Hawaiian hybrids	7	
Hindoo	1	Haw. Japanese Samoan	1	No race given	3	
Totals	15		44		20	508

* Including Portuguese and North European.

† Including one each of Syrian, Hindoo, Tahitian, Negro, Portuguese (negro?) and Philipino and "East Indian."

‡ Probably part Negro.

original crosses of Hawaiians with individuals of other races. This is professedly an estimate since we have only the probable racial complex of the individual and must infer the probable steps in his pedigree. Of the estimated 344 original crosses, 196, or 57 per cent, involved a Hawaiian and a "white" parent;[1] 105 or 30.5 per cent involved a Hawaiian and a Chinese

[1] The group classified as "white" includes chiefly parents from the North of Europe and from America. Most of them are probably of Nordic descent. There are also

parent; while eight or only two per cent were the results of crosses between Hawaiians and Japanese. In the remaining 10 per cent of cases the cross was between Hawaiian and a number of different races as set forth in the table. The frequency of mixtures as found in this sample is very similar to the relative frequency of marriages between Hawaiians and the other races mentioned as found by McCaughey (1919). Of 380 marriages between Hawaiians and "whites," Chinese, and Japanese in the period 1913–1917, 54 per cent were between whites and Hawaiians, 38 per cent were beween Chinese and Hawaiians, and only 8 per cent were between Japanese and Hawaiians. As regards only these three races or groups of races, the order of their amalgamation is the same as in our sample and indicates that the sample is probably representative. These differences in the relative amount of crossing which is taking place between the Hawaiians and whites, Chinese and Japanese are very significant as has already been pointed out by McCaughey and others. That the Japanese, who comprise over 50 per cent of the population of the islands, are playing almost no part in this hybridization experiment is perhaps the most significant point of all. Out of 7671 marriages of Japanese men in Hawaii, only 44 or less than a 0.5 per cent were with persons other than Japanese. This percentage is even lower for the Japanese women.

A further interesting indication of the table is that of the tri-racial hybrids found, all except one involved crosses of Hawaiians and whites, while the great majority were the results of crosses involving Hawaiians, Chinese and white. This latter combination is by far the commonest of any tri-racial mixture in Hawaii as is witnessed also by the census and marriage statistics.

The major part of our data on Hawaiian hybrids relates to those which have resulted from crosses between Hawaiians and whites and Hawaiians and Chinese and our remarks will be confined chiefly to these. The extent to which hybridization between these races or groups of races has proceeded may be roughly estimated from the frequency and the relative ages of hybrids of various generations. In the first generation are placed only those hybrids which were the direct offspring of matings of Hawaiians with one of the other races or groups. The total number of such hybrids is greater than that of any other generation. They range in age from very young children to the oldest subjects measured (seventy-three years in the case of one Hawaiian-white hybrid). This generation began to be produced

included under this heading twenty-three Portuguese parents, four Spanish and four with a small fraction of blood other than North European. Deleting these classes, the total number of Hawaiian-Nordic hybrids becomes 119.

probably as soon as white men and Chinese reached the islands, and it is of course being produced in large numbers at the present time.

The offspring of matings between such F_1 hybrids are classified in the F_2 or second hybrid generation. There is a possibility of error here, since the pedigrees of the subjects state in most cases "father ½ Hawaiian, ½ White; mother ½ Hawaiian, ½ White." We have regarded such subjects as second generation hybrids and most of them probably are, but there are other possibilities. The combination "½ Hawaiian, ½ White" might arise not only from a direct cross, but also from a cross of two subjects of later generations. This generation has doubtless been produced in small numbers for many years, but in our data the great majority of the F_2 Hawaiian-White hybrids are immature, while the oldest found was thirty-six years old. Of the F_2 Hawaiian-Chinese hybrids only six occurred in our sample, the oldest being thirty-eight years old.

The F_1 hybrids have however more often mated with members of one of the pure parent races than with each other. The offspring of such matings have been classified with the first backcross generation (BC). In general such backcrosses have been more common with pure Hawaiians than with either whites or Chinese. The first backcross generation is contemporary with the F_2 generation and the same age relations apply. Nearly all of the subjects are immature, the oldest among the hybrids with Chinese being twenty-five years old and the oldest among the "White" hybrids being fifty-one. As far as our data go the second generation from the original cross with Chinese, either F_2 or backcross, began to be produced in significant numbers only about thirty years ago and in large numbers much more recently. The Hawaiian-white hybrids are in general older and this generation has doubtless been produced for many years, although in large numbers only within the last few decades.

Those subjects classified as tri-racial hybrids are in general the offspring of crosses between two F_1 hybrids, the non-Hawaiian parents on the two sides of the pedigree belonging to different races. This might be called an outbred generation since instead of mating within the hybrid or parent-race group the F_1 hybrids have crossed with a third stock or race. This is generally also a second generation from the original cross and our records of 45 individuals of this generation show only five over twenty years old and the oldest as twenty-seven years old.

In the case of a few subjects in the Hawaiian-White group the indications are that hybridization has proceeded further than the second generation, and it is known that such is the case. In general, however, such cases have been very rare, and in the Hawaiian-Chinese group have not been

found at all. It therefore seems just to conclude that hybridization between the Hawaiians and other races is in its early stages, and that race mixture in Hawaii has not yet proceeded beyond the stage where genetic analysis is possible. The presence together of individuals of the pure races involved, of hybrids of the first and early generations, and the possibility of dealing with fairly simple mixtures are all favorable for a study of the results of crossing and of the inheritance of specific traits. The decrease in numbers of the native Hawaiians, and the increase in the number of hybrids indicate that the Hawaiian type will eventually exist only in hybrids between Hawaiians and other races. The production of complex hybrids involving three or more races or groups of races is an augury of still greater complexity to come since the different combinations possible will be enormously increased, which will entail greater and greater difficulties in tracing pedigrees and in securing enough subjects of similar breeding to serve as the basis of analysis.

The state of a hybrid population such as that which now comprises a part of the population of Hawaii is necessarily transitory and the most favorable time for studying it is the present or the immediate future, when the subjects which are now immature will be adult. The present study may be regarded as a first attempt to record in however incomplete a form, some of the results of this great natural experiment in race mixture which for obvious reasons will probably not be repeated.

HAWAIIAN-CHINESE RACE MIXTURE

The greatest amount of race mixture in Hawaii has, as we have seen, involved the Hawaiians on the one hand and the Chinese and the "white" races on the other. For many reasons hybridization between Hawaiians and Chinese provides the more favorable material for study. The most important reason is that the concepts Hawaiian and Chinese connote in Hawaii racial types of fairly definite descriptions. The Hawaiian is a Polynesian, the product probably of a certain amount of inbreeding, with a relatively short range of variability in most of his characteristics. The Chinese in Hawaii are almost without exception traceable to a restricted and definite racial source—the South Chinese of Quantung Province. Practically all of them have been imported as coolies from the district of Canton, and in physical type form a very conservative group, the variation constants for most of their measurements being relatively low. The term "white" on the other hand includes a large number of European types. In most cases it is only possible to know that a certain ascendant of a subject was

white; but even in cases where the nationality can be identified no definite racial type is guaranteed. Many of the "whites" who have participated in the crosses with Hawaiians have been Portuguese who reached Hawaii by way of the Cape Verde Islands and there is considerable evidence of Negro blood in the offspring of some of these "whites." Other "whites" have come from America and certainly "American" as a layman's description of race may mean anything at all. The study of the Hawaiian-White hybridization is of great interest in many ways but for our present purposes only the Hawaiian-Chinese group will be considered.

I shall not attempt to describe in detail all of the physical characteristics of the two races involved in this cross, although the anthropometic description of the Hawaiians is of interest since there is so little information on the physical anthropometry of living Hawaiians. Materials for an anthropometic description of the Hawaiians which will be more complete than we could attempt to make have been obtained by the Bishop Museum of Honolulu under the direction of Dr. L. R. Sullivan, and an authoritative account should await the publication of this information. In general I shall present a comparison of the Hawaiians and South Chinese using mainly those characteristics in which the two races differ and shall then compare the hybrids with the parent races. The descriptive constants for the physical measurements of the Hawaiians are founded on our series of 74 adult males and 34 adult females. In the descriptions of hair, eyes, etc., the immature subjects are also included, a total of 158 subjects. For the Chinese we have measurements of 12 adult males, and only three adult females, to which for descriptions of other characteristics may be added seven immature subjects—a total of 22, observed in Hawaii. In addition I have used measurements and observations of Hagen (1899) on 64 adult South Chinese coolies from Quantung—observed in Sumatra. The agreement beween these South Chinese and our series from Hawaii is close enough to assure us that in most characteristics our series is fairly representative of the South Chinese type. The hybrids include eighteen adult first generation (F_1) hybrids (seven males and eleven females) and ten immature subjects, a total of twenty-eight for nonmensurable characters; nine adult hybrids (three males and six females) produced by backcrosses of F_1 hybrids with pure Hawaiians and a total of 28 in this generation including immature subjects. Of the second hybrid generation only six subjects were observed of which but three are mature, and of the generation produced by backcrosses of F_1 hybrids with pure Chinese only five are available, all except one immature. The two last categories have not been included in a description of mensurable characters.

In tables 2 and 3 have been summarized the means of the principal mensurable characters of the Hawaiians, the South Chinese and their hybrids. The Hawaiian means have been calculated from grouped frequency distributions, that grouping having been used which gave the smoothest graduation of the data. The means of the smaller distributions

TABLE 2

Comparison of Hawaiians, Chinese and their hybrids. Adult males only; means of measurements

	HAWAIIAN	CHINESE (THIS SERIES)	CHINESE (HAGEN 1889)	F_1 HAWAIIAN × CHINESE
Number of subjects...	69–74	12	64	7
Dimension:				
Stature, cm.....	171.31±0.40	164.9 ±1.07	161.37±0.23*	167.16±2.00
Sitting height, cm....	90.11±0.24	87.8 ±0.69		89.21±0.96
Index of sitting height per cent...	52.61±0.11	53.05±0.32	53.2†	53.00±0.38
Height of acromion, cm.....	140.12±0.37	133.95±0.73		136.20±1.63
Arm length, cm.....	77.76±0.29	74.30±0.58	72.4§	73.86±1.13
Index of arm length per cent.....	45.28±0.12	45.00±0.25	45.0	44.22±0.40
Head length, mm...	182.42±0.70	187.67±1.42	182.31±0.55	179.86±2.79
Head breadth, mm..	152.03±0.45	149.25±1.13	149.48±0.49	152.29±1.55
Cephalic index, per cent.....	83.44±0.25	79.57±0.51	81.7 ±0.22§	84.67±0.82‡
Bi-zygomatic, mm..	140.19±0.65	139.75±0.87	140.66±0.41	138.71±1.77
Nasion-menton mm.	122.72±0.57	123.17±1.03	119.47±0.48	119.43±2.33
Facial index, per cent.....	87.67±0.41	87.92±0.90	85.3 ±0.39	86.17±1.17‡
Nasal height, mm...	53.59±0.32	52.25±0.60		52.43±0.74
Nasal breadth, mm..	44.22±0.22	40.83±0.43		39.43±0.54
Nasal index, per cent.....	82.94±0.61	78.50±1.14	79.0§	75.50±1.59

* With Weisbach's data mean height of 15,000 South Chinese is 162.2 cm.

† Quoted from Martin.

‡ Approximation.

§ Hagen's mean.

have been calculated from the ungrouped material. The measures of variation have not been given, but are low for both the Hawaiians and Chinese, indicating a high degree of conservatism in the physical characteristics of both races. The Chinese were somewhat less variable than the Hawaiians in most of their measurements.

Although the numbers of some classes are rather small, certain general indications may be noted in these comparison tables.

1. The Hawaiians exceed the Chinese in every dimension except head length and face height. The size of face in the two races is about equal.

2. The hybrids of both sexes are smaller than the Hawaiians in all dimensions. This is especially noticeable in the females (table 3) where the means of first generation hybrids are often below the midpoint between the Hawaiian and the probable Chinese means. There is in our data therefore no indication that hybrid vigor as expressed in physical size follows the crossing of these two distinct races. Hybrid vigor is, however, in crosses

TABLE 3

Comparison of Hawaiians and their hybrids with Chinese. Adult females only; means of measurements

	HAWAIIAN	F_1 HAWAIIAN × CHINESE	BC × HAWAIIN
Number of subjects	34	11	6
Stature, cm	162.59±0.59	157.54±1.17	158.18±1.43
Sitting height, cm	86.35±0.31	84.77±0.63	84.77±0.58
Index of sitting height, per cent	53.13±0.17	53.84±0.32	53.60±0.19
Height of acromion, cm	133.10±0.50	128.14±1.00	128.13±1.31
Arm length, cm	72.07±0.35	68.35±0.71	70.18±1.05
Index of arm length, per cent	44.33±0.17	43.38±0.35	44.35±0.29
Head length, mm	178.79±0.97	168.36±1.43	171.67±2.21
Head breadth, mm	150.26±0.68	144.73±1.35	143.33±1.61
Cephalic index, per cent	84.16±0.45	86.01±0.67	83.48±0.93
Bi-zygomatic, mm	136.71±0.79	131.18±1.30	133.83±1.60
Nasion-menton, mm	116.21±0.75	109.27±1.26	109.50±1.15
Facial index, per cent	85.07±0.45	83.36±0.77	81.82±
Nasal height, mm	50.68±0.45	47.55±0.57	48.00±0.94
Nasal breadth, mm	40.94±0.36	37.91±0.42	40.00±0.35
Nasal index, per cent	80.78±	79.90±1.10	83.63±1.17

of races not extremely divergent in size, more often expressed in greater speed of maturity, greater fecundity, resistance to disease, etc., on the part of the hybrid. Our evidence on these matters is insufficient and we can form no judgment upon them.

Comparisons of individual characters. In height, the Hawaiian males average about 171 cm. and are about as tall as the average of the white population of the United States. The Chinese in our series average about 165 cm. The Chinese of Hagen's series average 161 while a much larger series of about 15,000 males measured by Weisbach (quoted from Hagen) gives a racial height for the South Chinese of 162.2 cm. The Hawaiians

are therefore from about 6.5 to 9 cm. taller than the Chinese. The F_1 hybrids are a little over 167 cm. in height and are therefore about midway between the parent races in height. The same is true of the females, although we have not enough measurements of South Chinese females to establish a reliable average. The probable height of South Chinese females is about 155 cm., of the Hawaiian females 162.59 cm. and of the F_1 hybrids about 159.3 cm. The few individuals in the backcross generation, although they are three-fourths Hawaiian, are not taller than the F_1 hybrids although the numbers are too few to make this significant. Our evidence is not sufficient to determine whether segregation of parental statures takes place in later generations. Concerning stature we can only say that the crossing of the tall Hawaiians and the shorter Chinese produces F_1 hybrids which are intermediate between the parents in height.

Practically the same remarks may be made concerning the sitting height. When this dimension is considered as a proportion of the total height, however, the results are somewhat different. The index of sitting height of the Hawaiian males is 52.61, of the Chinese males of our series 53.05 and of Hagen's series 53.2. The difference is less than three times its probable error and is of doubtful significance. The probabilities are that the South Chinese have slightly longer trunks than the Hawaiians. The F_1 hybrids of both sexes have likewise slightly longer trunks than the Hawaiians.

In arm length the Hawaiians exceed the Chinese by about 3 cm. The hybrids of both sexes are nearer the Chinese in mean arm length, their arms being slightly shorter than those of the Chinese although these differences are small and probably not significant. There is practically no difference between the two races in relative arm length although the hybrids have a relatively shorter arm than either parent.

In the remaining segment of stature, height of acromion, the hybrids are intermediate between the parent races. For stature and its segments, therefore, the result is in general a blend in the first generation, with indications of dominance of the longer relative trunk of the Chinese.

CEPHALIC AND FACIAL DIMENSIONS

In shape of head the two parent races present a clearly marked difference. The Hawaiians are predominantly brachycephalic (see table 4) about 88 per cent of the individuals measured having a cephalic index of 80 or over with a mean index of 83.44 for the males and 84.16 for the females. Only about three per cent of the subjects are dolichocephalic and all of these are

near the upper limit of that class.[2] The Chinese on the other hand are meso- or subbrachycephalic with a mean index of 79.57 for the males in our sample. Dolichocephaly is of much commoner occurrence among the Chinese, about one-sixth of our subjects falling in that class. The racial difference in mean cephalic index is equal to about seven times its probable error and is statistically significant. The first generation hybrids are predominantly brachycephalic; no dolichocephalic subjects were found; the same proportion of brachycephalic subjects occurs as in the pure Hawaiians, and the mean cephalic index of this generation is higher than that of either parent race. The difference in cephalic index between the F_1 hybrids and the Hawaiians is but little greater than its probable error for the males while for the females it is 27 times its error and is possibly significant. In general then, the hybrids, although resembling the Hawaiians more than the Chinese in head form, are somewhat more brachycephalic than either parent race.

COMPARISON HAWAIIANS, CHINESE AND THEIR HYBRIDS

TABLE 4

Head form (males and females combined)

RACE	NUMBER	PER CENT DOLICHO-CEPHALIC 74.9	PER CENT MESOCE-PHALIC 75-79.9	PER CENT BRACHY-CEPHALIC 80	MEAN INDEX
Hawaiian	108	2.1	9.8	88.0	82.92
Chinese	12	16.7	33.3	50.0	79.59
F_1	18		11.7	88.3	85.49
$F_1 \times$ Hawaiian	9	11.1	22.2	66.6	82.68

In absolute breadth of head the males of the two parent races differ from each other by about 3 mm. This difference is in favor of the Hawaiians and applies to the Chinese of our sample as well as to those of Hagen's series. The racial difference in head breadth (using the mean of the larger Chinese series) is $2.55 \pm .66$ cm. and is probably a significant difference. The head breadth of the hybrid males is practically the same as that of the pure Hawaiians, while the difference between hybrids and Chinese, although absolutely large is less than three times its error. These facts, however,

[2] There is a possibility that attempts to flatten the occiput during infancy together with methods of cradling may play some part in determining the head shape of Hawaiians. Stokes (Amer. Jour. Phys. Anth. 1918) was unable to find evidence that deformation practices were ever very general in Hawaii and they are practically unknown at present. They have probably not influenced the shape of heads of the subjects measured in this investigation and no deformed heads were noted by the observer.

do not obtain with the females for here the head breadth of the hybrids is significantly less than that of the Hawaiians.

In absolute head length the Chinese males of our sample exceed the Hawaiians by about 5 mm. The head length of the Chinese measured by Hagen, however, is the same as that of the Hawaiians, and differs markedly from the mean of our series. This may have been due to a slight difference in technique, for it is probable from the observations made in this and previous studies that the Chinese have absolutely longer heads than the Hawaiians. In the hybrids of both sexes, the absolute length of head is less than in either pure race. This difference is especially marked among the females where the difference between the mean head length of the Hawaiians and the F_1 hybrids is 10.43 ± 1.73 mm., which is certainly significant. The relatively high cephalic index of the hybrids is therefore due rather to an absolute shortening of the long diameter than to any striking increase in breadth. This indicates, probably, dominance of hereditary factors for short headedness and for broadheadedness. The hypothesis of dominance of brachy- over dolichocephaly has been employed in numerous cases and is supported by considerable evidence, including that from the present study. But it does not explain why the hybrids are absolutely and relatively shorter headed than either parent race. The explanation of this last fact probably is to be found in the differences in general bodily form and especially in stature between the parent races and the hybrids. The hybrids are shorter and in general smaller than the Hawaiian. It is well known that stature and absolute length of head are more closely correlated than stature and breadth of head.[3] Differences in stature, therefore, affect the long dimension more seriously than the breadth of the head and there is a consequent change in the shape of the head in passing from tall to short individuals or groups. In the present case, the dominant factors for short headedness are transmitted from the taller Hawaiians to the shorter hybrids, where they are combined with factors for smaller general size. The effect of bodily size on head breadth is probably much less so that the gross effect is a relatively shorter head. Our data are not sufficient for the detection of segregation of head shapes in later generations.

In facial diameters the parent races present practically no differences, both having large, almost massive faces with relatively high facial indices. The absolute measurements of the hybrid males are somewhat smaller and the index somewhat lower than those of the parent races, but in view of the

		(1899)	(1907)
[3] Boas (1899 and 1907)	Stature—Head length.....	r = 0.26	r = 0.42
	Stature—Head breadth	r = 0.09	r = 0.21

errors involved the differences are not significant. In the female hybrids the faces are noticeably smaller than in the Hawaiians and relatively somewhat longer.

One further difference in mensurable characters remains to be mentioned. This has to do with width and shape of nose. Although differing somewhat in height of nose (in which the hybrids are probably intermediate between the Hawaiians and the Chinese) the more important difference is in width. Here the difference between the parents is somewhat greater, the Hawaiian nose being broader than the Chinese. In the hybrids the nose is narrow as among the Chinese, and the shape is, therefore, slightly different than in either parent race, being relatively somewhat narrower. Both parent races and hybrids are however, mesorhinic and small differences in such a variable character are not of great importance.

HAIR AND EYES

The eye color of both the Hawaiians and the Chinese is predominantly a medium to dark brown, and no other eye colors were encountered among the hybrids. In hair color also there are no important differences between the parent races, since black is the prevailing color. Among the Hawaiians, a few (10 out of 154) were found with dark brown hair, while two "red" Hawaiians were noted. These "red" Hawaiians are called "Ehu," and they represent possibly the result of segregation of recessive blondness which may have originated by mutation or been introduced by some unknown cross. Apparently this hair color has also entered into the hybrids with the Chinese, since one red haired subject was observed in the generation produced by a backcross of an F_1 hybrid with a pure Hawaiian.

In hair form the parent races are distinctly different. The hair of the Hawaiians is wavy or curly, 87 per cent of the 155 subjects falling in these classes. Six cases of frizzy, crinkly or kinky hair were found which may possibly represent Negro or Negrito intermixture. Their rarity indicates that they are probably not normal in pure Hawaiians. Likewise fourteen cases of straight hair were found. The type of straight hair found among the Hawaiians is probably to be distinguished from the straight hair characteristic of Chinese and Mongoloid peoples in general. It is less coarse and probably similar to the straight hair found among Caucasian peoples.

The Chinese have typical coarse, smooth, straight hair of the Mongolian type. In two subjects waviness was recorded. Although normal in other respects these may have had an admixture of Portuguese or Negro blood and are undoubtedly not typical of the South Chinese. Hagen found only straight hair among the South Chinese which he observed.

TABLE 5

Eye color

	VERY LIGHT	LIGHT BROWN	BROWN	DARK BROWN	VERY DARK BROWN	BLACK	NO RECORD	TOTAL
Hawaiian	2	17	69	61	7		2	158
Chinese		2	10	5	1	3	1	22
F_1		1	15	11			1	28
F_2		1	1	4				6
$F_1 \times$ Hawaiian		2	12	12	2			28
$F_1 \times$ Chinese			1	3			1	5
$\frac{1}{8}$–$\frac{1}{4}$ Chinese?			3	5				8

TABLE 6

Hair color

		RED-BROWN	LIGHT BROWN	BROWN	DARK BROWN	BLACK	NO RECORD	TOTAL
Hawaiian		2		1	10	141	4	158
Chinese					1	21		22
F_1					2	26		28
F_2				1		5		6
$F_1 \times$ Hawaiian		1			3	24		28
$F_1 \times$ Chinese						4	1	5
$\frac{1}{8}$–$\frac{1}{4}$ Chinese					1	7		8

TABLE 7

Hair form

	STRAIGHT	WAVY	CURLY	FRIZZY	CRINKLY	KINKY	WIRY	NO RECORD	TOTAL
Hawaiian	14	90	45	3	2	1		3	158
Chinese	20	2*							22
F_1	18	8	1				1		28
F_2	3	3							6
$F_1 \times$ Hawaiian	9	14	5						28
$F_1 \times$ Chinese	2	1	1					1	5
$\frac{1}{8}$–$\frac{1}{4}$ Chinese	5	3							8

* Doubtful.

Of the first generation hybrids the majority (18 out of 28) have straight hair of the Mongolian type. Eight have wavy hair, one is recorded as curly and one as wiry. A possible explanation of this lack of uniformity in the first generation hybrids is that the Mongolian type of straight hair is domi-

nant to wavy and curly, as suggested by Bean (1911); and that the occurrence of wavy and curly hair in F_1 is due to misinformation concerning the parentage of the subjects resulting in their assignment to the first instead of to the second or other generation. Both types of hair appear in the second generation although the numbers are too small to indicate in what ratio. The distribution of hair form in the generation produced by backcrosses of F_1 hybrids with Hawaiians is at variance with the hypothesis of dominance of the Mongolian straight hair. On this hypothesis equal numbers of straight and wavy (or curly) individuals are expected, whereas the actual ratio is 19 wavy and curly to 9 straight or approximately 2:1. In the majority of the cases the hair form of the parents of a particular hybrid is unknown. If one parent is known to be an F_1 hybrid, the hair form is assumed as straight; if Hawaiian, it is assumed that the hair was wavy or curly. Since only the race of the parent is known it is of course possible that the parent varied in this characteristic from the racial type. In one case the particular parents and their offspring were observed and the results in this case more nearly accord with expectation. The mother was a first generation hybrid. Her hair form was straight. The father was a pure Hawaiian with curly hair. Of the eight children observed, five had curly, and three had straight hair. The expectation is equal numbers of curly and straight-haired offspring. Throughout the hybrid generations individuals with wavy and curly hair are in excess and the theory of simple dominance of straight hair cannot explain this excess. Either dominance is incomplete or more than one factor is necessary for the expression of straight hair. Observations within several generations of single families would be needed to establish the exact mode of inheritance.

The occurrence of the Mongolian fold (see table 8) marks an additional difference between the South Chinese and the Hawaiians, although it is impossible to characterize either of these races by the simple presence or absence of this trait. It is apparently rare among pure Hawaiians, since of the 158 subjects observed, only four (2.5 per cent) were found to have the fold and these were all recorded as "slight Mongolian fold." It is present in the majority of the Chinese, twelve (54.5 per cent) out of 22 subjects examined having a typical Mongolian fold. Of the South Chinese examined by Hagen 80 per cent had this peculiarity. It is, therefore, not present in all South Chinese, a fact which must be considered when we examine the first generation hybrids. In this generation, the Mongolian fold was found in ten out of 28 subjects or in 35.7 per cent of the cases. Its frequency is hence less than in the pure Chinese, but considerably higher than in the Hawaiians. It is undoubtedly a dominant trait since it is

expressed in the hybrid. Those hybrids in which it does not occur are probably the offspring of Chinese parents which did not possess it. Although expressed in the hybrid, dominance is probably not perfect since in four of the hybrids the Mongolian fold was less marked than in the typical Chinese. Even among the Chinese, however, there is considerable variation in the fold.

In the second generation the Mongolian fold appears in two out of six subjects while in the backcross of F_1 with Hawaiians its frequency is exactly that to be expected if its expression is determined by one dominant factor. The numbers for this generation are 14 subjects with the Mongolian fold and 14 without it. From matings of F_1 hybrids with pure Chinese we have records of five subjects—three of them with the fold and two without it. Here again we are unable in the absence of observations on individual

TABLE 8

Mongolian fold

	PRESENT	ABSENT	PER CENT PRESENT	PER CENT ABSENT
Hawaiian	4*	154	2.5	97.5
Chinese	12	10	54.5	45.5
Chinese (Hagen)			80.0	20.0
F_1 Hawaiian Chinese	10	18	35.7	64.3
F_2 Hawaiian Chinese	2	4	33.3	66.6
$F_1 \times$ Hawaiian	14	14	50.0	50.0
$F_1 \times$ Chinese	3	2	60.0	40.0

* Entered as "slight."

matings to state the exact method of transmission of this character. It is certainly inherited as a dominant and individuals not possessing the trait probably do not transmit it. From a cross of an F_1 hybrid between Hawaiian and Chinese which did not show the Mongolian fold with a pure Hawaiian which also lacked the trait, eight children were observed none of whom showed a trace of the fold, so that it is probable that where the Chinese parents of the hybrids lack the fold, it does not appear in later generations.

SUMMARY OF COMPARISONS OF INDIVIDUAL CHARACTER

In most of the measurable traits in which the Chinese and Hawaiians differ, the first hybrid generation is intermediate between the parents, and there is no evidence of hybrid vigor as expressed in increased size. In relative trunk length the hybrids probably resemble the Chinese more than the Hawaiians, while in head shape there is evidence of dominance of the

rounder head of the Hawaiians, which is perhaps exaggerated by its combination with shorter stature in the hybrids. Segregation of parental types is not evident in the small number of subjects of generations later than the first, although in the individual records new combinations of traits of the two parent races are encountered, indicating independent inheritance of separate traits.

The coarse straight hair of the Chinese is probably dominant over the finer wavy or curly hair of the Hawaiians, although the evidence is not conclusive. The Mongolian (epicanthic) fold is apparently inherited as a dominant, its expression depending possibly on one main unit factor.

In general appearance, therefore, the hybrids resemble the Chinese more than the Hawaiians, and it is probable that the genetic constitution of the Chinese includes relatively more dominant factors than that of the Hawaiians. This will tend to give the hybrid population arising from the amalgamation of Hawaiians and Chinese a Mongoloid rather than a Polynesian appearance. However, the fact that the characters which enter this cross do not all blend in inheritance, but that some of them probably depend on relatively few Mendelian factors, make it appear probable that the new population will have a new appearance due to the recombinations of traits from both races and will on this account be for sometime to come more variable in its physical (and probably in its mental traits) than either of the conservative racial types from which it originated.

In addition it must be remembered that the parental types are to become less numerous in the population, the Chinese by exclusion and the pure Hawaiians by natural decrease and out-marriages, so that crosses of hybrids inter-se will increase, with greater opportunities for the recombinations of traits. Finally the increasing frequency of hybrids between Hawaiians and the white races, bringing in still additional physical traits, will result in more and more combinations of Caucasian, Mongolian and Polynesian characteristics out of which extremely diverse types will be formed and if this combination survives physical and economic competition with the Japanese it will constitute an important element of the future population of Hawaii.

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INTERMARRIAGE BETWEEN JEWS AND CHRISTIANS

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Next to color, the greatest bar to fusion of civilized ethnic strata of humanity has been religion. Moreover, as long as marriage was a purely religious affair, intermarriages between persons of different religious denominations were extremely rare. Civil marriage was introduced about one hundred years ago into modern western states, while in Spain, Portugal, etc., all matrimonial affairs are still in the hands of the clergy, and in Russia, Poland, and Austria, marriages between persons of different creeds have been made possible since the revolution a couple of years ago.

Even in countries in which civil marriage is tolerated, intermarriages between Catholics and Protestants bear but a small proportion to those in which the unions are consecrated between coreligionists. This is but natural when we bear in mind that marriage is purely a social phenomenon, engendered by social contact, and the elements of a population which are isolated for any reason will remain mainly endogamous, marrying almost exclusively within their own groups. In addition to the many obvious negative factors which religion offers to any marriage with members outside of its own group, it also offers opportunities for social contact between the younger folks in the church, at home, and in the various communal activities which are part and parcel of group life.

In its attempts at discouraging marriage with persons of other denominations, religion has of late been losing ground, though the majority of marriages are even today consecrated between persons of the same faith. However, statistical data, wherever available, show that the tendency of late has been in the direction of such "mixed marriages," as they are at times called. It has reached a stage that in Protestant countries the Catholic clergy have renewed their energies against this sort of marriages on the ground that the Catholic Church is thus losing numerous adherents because the children born to such mixed couples are mostly raised in the religion of the majority. Similar complaints are made by the Protestant clergy in Catholic countries.

The survival of the Jews among the nations as a religious minority, and some maintain as an ethnic group, for centuries appears to have been mainly

due to the abstinence from intermarriage with those of other faiths. In this regard, the Jewish religion has been a greater force for social isolation and discouragement of exogamy than Christianity. Certain rituals, especially the dietary laws, have made marriage outside the pale of Judaism almost impossible. When men and women cannot partake a meal at one table, they cannot become intimately acquainted; and as long as there is no intimate social contact, there can be no marriage. The student of social science who carefully examines the facts will inevitably arrive at the conclusion that as long as the Jews adhere to their religious practices, and rigidly observe the dietary laws, no marriages between them and those of other faiths can take place.

Within the past fifty years a radical change has taken place in this regard among the Jews of Western Europe and America. The Jew who will not partake food not prepared in accordance with the dietary laws is, at present, exceptional, especially among the younger, the marriageable, generation. Social contact between Jews and Christians has thus created conditions favorable for intermarriage, and mixed marriages are becoming more and more common. The proportion of "mixed marriages" is larger the less devoted they are to the separative rituals of their religion. Available statistics tend to show that in Europe the proportion of mixed marriages is largest in western Europe, and decreases as we approach eastern Europe.

Denominational statistics of marriage are not collected, or published, in most western countries, and for this reason it is not possible to give exact figures as to the extent of intermarrige between Jews and Christians. But in some, official statistics do contain figures bearing on this subject, and when collated they are amazing to those who believe the Jews are still endogamous. The most reliable are those published by the German government as to conditions in that country. The following table gives the evolution of intermarriage in Germany.

PERIOD	TO 100 PURE JEWISH MARRIAGES, JEWS MARRIED		
	Christian husbands	Christian wives	Total mixed marriages
1901–1904	8.01	9.26	17.27
1905–1909	12.41	10.38	22.79
1910	14.57	11.29	25.86

It is thus seen that one out of four Jews who married in Germany during 1910, married outside of the pale of Judaism. The statistics for the past ten years are not available while this paper is prepared, but it is known that these marriages have of late increased very much. In some German states

the proportion of mixed marriages has been even larger. The following table gives figures about conditions in Prussia:

PERIOD	TO 100 PURE JEWISH MARRIAGES, JEWS MARRIED		
	Christian husbands	Christian wives	Total mixed marriages
1875–1884	5.35	4.52	9.75
1885–1894	6.06	6.39	12.45
1895–1899	7.91	9.04	16.95
1900–1907	9.85	11.32	21.17
1908–1910	12.78	15.21	27.99
1911–1913	12.65	18.05	30.70

High as are these percentages of marriages between Jews and Christians in Prussia, reaching 30 per cent of all Jews who enter matrimony, they are exceeded in large cities of Germany. Thus, for Berlin the following figures show conditions:

PERIOD	TO 100 PURE JEWISH MARRIAGES, JEWS MARRIED		
	Christian husbands	Christian wives	Total mixed marriages
1875–1879	16.43	19.64	36.07
1895–1899	13.07	21.05	34.12
1905–1906	18.65	25.40	44.05

In some cities in Germany the percentage of mixed marriages is even higher, reaching 60 in Hamburg.

It appears that the sparser the Jewish population in a country, the greater the proportion of mixed marriages. Thus, in Scandinavian countries, where statistics have been published from which figures bearing on our subject may be gleaned, conditions are as follows: In Copenhagen the percentage of Jews who married Christians was in 1888–1890, 55.17 per cent; in 1891–1900, 71.07 per cent; in 1901–1905, 96.05 per cent. In Sweden the number of mixed marriages exceeded the number of pure Jewish marriages during 1881–1900; from 1901 on the percentages of mixed marriages were as follows: 1901–1904, 111.1 per cent; 1905–1908, 75 per cent. The decrease in the last mentioned period has been ascribed to the influx of Russian Jews into Sweden, and they, being aliens, are more apt to marry, at least during the first generation, with their own.

Similar conditions are reported to prevail in Italy and France among the native Jews. In those countries there are but few native Jews who have no Christian relatives by marriage. Even in Amsterdam, where the Jews

have held on to their religion much more tenaciously than in other western countries, the proportion of mixed marriages has been over 12 per cent according to official statistics published by the municipality of that city.

In eastern Europe intermarriages have not been frequent for several reasons. The Jews there have held on more tenaciously to the separative tenets of their religion, thus remaining socially isolated from their Christian neighbors, the strongest preventative of intermarriage. In this regard, Judaism was reinforced by the law of the eastern states. In Russia and Poland, where about one-half the total number of Jews in the world reside, marriages between Jews and Christians were prohibited by law; the same was true of Austria. However, in Austria marriage between a Jew or Christian with a dissenter, or freethinker, was permitted, Jews who wanted to marry with persons of other faiths took advantage of this loophole in the law, and one of the contracting parties declared himself or herself a dissenter, and thus a mixed marriage was legalized. Such mixed marriages have been very frequent in the large cities in Austria; in Vienna they reached about 15 per cent of all the marriages in which Jews were concerned. In Hungary, where mixed marriages are permitted by law, one out of five marriages in Budapest in which Jews participated were contracted with Christians.

As was already stated, in Russia and Poland the law prohibited marriages of Jews with Christians and there was no way of legalizing such marriages, excepting by baptism of the Jew. But since the revolution three years ago the number of mixed marriages has increased enormously, and it seems as if in the near future conditions will not differ materially from those we described of western Europe. For obvious reasons we have no figures as to the exact proportion of mixed marriages at present in Russia.

Intermarriage between Jews and Christians is also ripe in Anglo-Saxon countries to a degree not appreciated by the average observer. Bearing in mind that for the past thirty years there has been a steady, and relatively extensive, immigration of Jews from eastern Europe into Anglo-Saxon countries, we must, when speaking of intermarriage, separate those who are natives of these countries from those who have only recently arrived. The former who, to be sure, are in the minority, marry very frequently out of their pale; the latter, because of social isolation from the Christian population owing to linguistic and other differences, and more or less strict adherence to the tenets of their religion, are mainly endogamous, but not to the extent generally believed.

As a rule, Anglo-Saxon countries do not publish vital statistics along denominational lines, and for this reason we have no exact statistical data

as to the proportion of mixed marriages. But in Australia there have been published some official statistics on this subject. In New South Wales, during the census of 1901 it was found that of all married Jews, 781 were married to Jewesses, and 360, i.e., 46.1 per cent, were married to Christians. In Western Australia, 157 Jews were married to Jewesses, and 62 to Christians, again 39.5 per cent of mixed marriages. It may be said without fear of overestimation, that of Jews who have lived for two or more generations in England and the United States at least as many are married to Christians as in Australia. There is ample evidence to this effect, as will be shown later on.

But even the immigrants, and especially the first generation of Jews living in Anglo-Saxon countries, are not completely endogamous. We have seen that so long as the law does not prohibit intermarriage, only social isolation is in the way. But here there are many points of social contact and they very frequently lead to mixed marriages. The Jews here have more or less discarded the anti-social dietary laws; religion thus does not make it absolutely impossible for them to come into intimate social contact with people of other faiths. The result is that in New York City numerous immigrant Jews have married with other immigrant people, especially Italians who live side by side with the Jews in the tenement districts of the city. The same is true of Jews engaged in industrial and mercantile pursuits, who are either of the more tutored class, or natives of the first generation who marry Americans very frequently. How far social contact leads to intermarriage is seen in one very well defined class of Jews in this city,—the school teachers and social workers, among whom the proportion of mixed marriages is very high. In the western and southern states of this country, where the isolation of large and compact groups of Jews in immigrant "colonies" is exceptional, or absent, intermarriage is very rife. This is not peculiar to the Jews of the United States. Other immigrants, as the Irish, Italians, or Germans, marry mainly among their own in the cities where they live in large and compact groups, while in the country, where they are sparse, exogamy is very frequent.

From the standpoint of the preservation of Judaism, intermarriage has been considered a disaster, robbing as it does the Jews of its best adherents. In fact, those who have recently taken stock in Jewish affairs have arrived at the conclusion that mixed marriages rob the Jews of more adherents than persecutions. The reasons are obvious when we consider that it is the final result of the abjuration of nearly everything that has kept the Jews alive among the nations for centuries. Without the separative tenets of its religious practices, Judaism is inconceivable and in danger of extinction

through absorption by the surrounding majority of other faiths. In fact, those who marry Christians are lost to Judaism within two or, at most, three generations.

Available statistical data show that the children born to Jews married to Christians are nearly all raised as Christians. Even the few that are raised as Jews are more apt to marry out of the faith than those born to Jews. This has been the case in Scandinavian countries, as well as in Germany, Italy, France, etc.

Moreover, it appears that intermarriage robs the Jews of their best racial elements. Careful observation of Jewish life during the past century reveals the following interesting facts: Success for a Jew in any line of human endeavor, be it financial, industrial, scientific, literary, or artistic, means that his descendants will be lost within two or three generations through intermarriage with Christians. The result is that of nearly all great and talented Jews during the nineteenth century hardly any have left descendants within the fold of Judaism. The few exceptions that may be mentioned prove this contention because they also have Christian relatives by marriage.

Another important harm is done by intermarriage to those who remain within the fold. The proportion of parvenues is enormous among them because those who have attained eminence in any field are lost, and their descendants, if they remained within the fold might have created a nucleus of a Jewish aristocracy. Intermarriage deprives them of it, and they are apt to be judged by their worst, or by those who have not yet adapted themselves to the higher things in life, though they have achieved success in some field.

But the Jews are not only robbed of the exceptionally able and talented through intermarriage. Wherever it is carried very far, the Jews are more or less completely absorbed by the Christians around them. Thus, the Spanish and Portuguese Jews in England and the United States, and to a certain degree in France and Italy, have nearly all disappeared by fusion with the non-Jewish population. Many of them are now recognized as members of Christian churches in the countries in which their parents or grandparents prayed in the synagogues. It is curious that in one country in which the church and state were not in the way for three or four centuries, intermarriages have completely wiped out the Jews. This occurred in China, where about three hundred years ago large and flourishing Jewish communities existed, but at present they have all disappeared. The Jews who live there at present are recent arrivals from Europe. Of the endogenous Jews hardly a trace has been left.

The Jews disappeared in China because of intermarriage with the Mongolians among whom they lived and they were not replaced by immigration from other countries. In the United States, England, France, Italy, and other western countries conditions not unlike those mentioned prevail. The Jews who have lived there during the seventeenth and eighteenth centuries have almost all been fused with the Christian population; very few of their descendants have been left within the fold of Judaism. But in the eastern European countries, in which, as was already shown, intermarriage was not permitted, the number of Jews kept on increasing during the past two or three hundred years, so that more than one-half of the total number of Jews in the world live in Russia, Poland, Austria, Roumania, etc. These Eastern Jews have been immigrating west during the past fifty years and replaced those who were lost through intermarriage. In fact, it appears that very few of the Jewish families in Germany, England, France, etc. can trace back their ancestry as residents of those countries for more than two or three generations. Inquiry also reveals that in most cases they had immigrated from Eastern Europe during the past fifty or seventy-five years.

However, things have changed in eastern Europe during recent years. Since the revolution, the prohibition of intermarriage in Russia and Poland has been abrogated and the result is that marriages of this sort have already become very common, and they are bound to increase in number. Some even maintain that, for special reasons, the number of Jews who will marry Christians in those countries will exceed that observed in western countries. It is thus clear that in the near future there will not be a surplus of Jews for migration to western countries to replace those lost through fusion with Christians. The recent nationalist movement among the Jews is mainly the result of these conditions. They face extinction among the European and American nations because they cannot rigidly observe the separative tenets of their religion, and relaxation in this regard brings them into intimate contact with the surrounding majority of other faiths. Intermarriages are the inevitable result. The zionists believe that only in their own home, in Palestine, will they be in a position to save the remnants of Israel.

Intermarriages of the kind spoken of in this paper have been objected to because it has been alleged that race mixtures are not desirable. Some have stated that most of the vices of both original stocks are accentuated in the offspring, while hardly any of the virtues are transmitted. It has also been stated that mixed marriages turn out unfortunate in too many cases, and sterility is rather common. Most of these contentions come from

sentimentalists, Jewish as well as Christian, and do not deserve serious consideration. One thing, however, must be emphasized: The flow of so-called "Jewish blood" into the veins of other white peoples does not introduce any new or alien racial elements. It has been agreed by nearly all competent anthropologists that the Jews are a composite ethnic unit; a racial blend in which nearly all the types of white humanity have entered. While they are predominently brunette, about 30 per cent have blond traits. In Italy and France fusion results, as a rule, in a racial product which cannot be differentiated from the rest of the population. In northern countries the same is true, because the proportion of brunettes is more or less high everywhere. In fact, within two or three generations, the descendants of mixed marriages are fused with the general population of any country beyond recognition.

For those who look with apprehension at "race mixture," it may be stated that the flow of Jewish blood into the veins of the European and American peoples does not infuse any new racial elements for the reasons just stated. And it is well known that intermixture of the European ethnic elements has proved to be of immense advantage to the European nations. The most progressive nations are those who can lay least claim to ideal racial purity. England, Germany, France, Italy and especially the United States, though populated by peoples in whose veins flow the blood of nearly all ethnic elements in creation, cannot be considered backward nations. On the other hand, witness the homogeneous populations of central Asia, and Africa, free from any racial admixture, but in a low stage of mental evolution.

Moreover, it appears that the offspring of mixed marriages of which we just spoke is apt to be superior. Grant Allen some years ago said that the number of talented and distinguished people is rather extraordinary among those descended from Jewish-Christian married couples. Indeed, when we contemplate the number of persons of half-Jewish origin who have attained distinction and eminence in various fields of human endeavor, it appears that Grant Allen was right. To mention but few: Montaigne, the great French essayist had a Jewish mother; Sir John Herschel, the English astronomer had a Jewish father; Mendelejeff, the great chemist, and Metchnikoff, the biologist, Bret Harte, the novelist, Francis Turner Palgrave, the critic, W. Clifford Palgrave, the traveller, Sir Henry Drummond Wolff, the English diplomatist and politician; Prevost Paradol, the journalist and author; Paul Lindau, the German critic; G. Ebers, the Egyptologist, Paul Heyse, the German novelist and poet; Edwin Booth, the actor; Mrs. Keely, the actress; Daniele Manin, the Italian revolutionist;

Leon Gambetta, the French statesman; Sir John Millais, the British painter; Sir A. Sullivan, the noted English composer and conductor, Ludovic Halévy, the French composer; and many others. Among those who have achieved notable success in commercial, industrial and financial fields the number of half-Jews appears to be enormous.

It is for this reason that those interested in improving the human breed have no apprehension at the infusion of so-called Jewish blood into the veins of modern European and American nations.

SOME NOTES ON THE JEWISH PROBLEM

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The Jewish question, so old and so persistent, as difficult of analysis as of solution, a storm center for so many weary years, demands not merely a sympathetic attitude of mind, but that every avenue of approach shall be searched in the attempt to obtain a complete understanding of the problems at issue. It is in this belief that I venture to place before the Congress some views which I have long held, and which I hope may help both Jew and Gentile to understand mutually a problem which both must solve.

There has been a very widespread antagonism between Jew and Gentile both in time and space, the intensity of which may vary from the cold glance of a selfmade society leader to the violence which culminates in pogroms. But wherever this antagonism exists, two facts emerge: the first that its degree varies directly with the mass of the Jewish infiltration, and the second that the antagonism is collective rather than individual. To appreciate therefore some of the underlying causes it is well to study the peculiar forces at work in the Jewish masses.

When we consider the social phenomena of a free people living under a long established civilization and government such as we have in this country, or in America, we are able to regard the population as made up of certain more or less definite social grades. We speak of "upper," "middle," and "lower" classes, and these terms connote very definite ideas in our mind, both as regards the environment of each class and the persons who go to make it up. In a free country it is possible though it is difficult for the poor and the worker to rise—but the difficulty is of such an order that it acts rather in deterring the less capable, and in delaying rather than defeating the ambitions of the intellectual and the virile. The same conditions that allow an individual to arise permit of the rich or the aristocrat to fall, and just as the rise of the gifted aspirant is certain though delayed, so the fall of the waster, though it may be delayed by the circumstances of his late environment, is in the long run inevitable. But it is well known that on the whole the classes remain extraordinarily stationary, and that the expresssion "a good family," though it may carry a taint of snobbery, does in reality convey a real meaning and a definite fact. Thus, it is but expressing a

general truth when one admits that an individual of the lower class is there because it is the only place he is capable of attaining. One may not go so far as Nicofero[1] who expressed very much the same idea when he said "Individuals belonging to the lower classes present, in comparison with subjects of the higher classes, a lesser development of the figure, of the cranial circumference, of the sensibility, of the resistance to mental fatigue, a delay in the epoch when puberty manifests itself, a slowness in the growth, a large number of anomalies and of cases of arrested development." But that the tendency of society towards stratification is as natural as the sedimentation of the rocks, the present writer is convinced. We may delay the process, vary the forces, yet the basic material with which we are dealing admits of no other form of equilibrium. In both the upper and lower classes one notes exceptional individuals below the average in the upper and above the average in the lower, and it is the convection currents set up by the passage of these individuals to the groups above and below which prevent the classes being completely stationary and which give a flavor of romance to life. The study of genetics has but confirmed history. The Russian experiment of proclaiming the directorate of the proletariate does on the one hand but acknowledge the truth and validity of the very class legislation it sets out to destroy and on the other but demonstrates that as in nature so in human society an inversion of the strata can only be effected by vast and cataclysmic upheaval. The Jewish communities of today are not built on this basis. There has never been an outstanding aristocracy of the ghettos. In earlier days, when learning was prized above all else, the rich man looked only for a learned son-in-law, and means had no part in his choice. Even to our own times this rule has held in Eastern Jewry. But what has exerted a much greater influence than this in bringing about a differentiation between the structure of the Jewish community and that of the general population, is the fact that Jewish communities have not been free and independent and have not lived under a continuous civilization spacious in time as well as locale. On the contrary, they have always been restricted in area as well as liberty. The result is that wealth and position have afforded no continuous protection. Brains and tenacity of life have been the only factors which have preserved the individual, and he who lacked either tended rapidly to sink altogether. It is true that even in the confined Jewish communities of Eastern Europe you have rich and poor—a very few rich, and very many poor. The former, however, only maintain their

[1] Nicofero, A. The cause of the inferiority of physical and mental characters in lower social classes. Problems in Eugenics, 1912, p. 184.

position by means of special privileges and enjoy little confidence that their children will inherit their improved but precarious position. In Western Europe and America we have seen that the deserving aspirant from the lower classes is delayed rather than prevented from making his way upwards. In the ghetto it has been otherwise, the road was barred and bolted. Vainly did the gifted youth with soul aflame beat with bleeding hands against those gates but to sink back exhausted into the arms of his brethren. Infinite the pain and bitter though the experience was, yet all was not lost, for what the outside world refused the parent body reabsorbed. Bruised in body and spirit, was he not still a son of Israel, child of the covenant, for whom there was still the traditional learning of his people to absorb the cravings of his intellect and the habitual morality to refine his character? And so we find that in the ghetto intellectual distinction became more and more confined to the pursuit of Rabbinic studies, and that the greater the segregation of the Jewish communities from the outside world, the more distinguished the Rabbinic authorities they produced.

The arguments adduced in favor of the enforced stability of the ghetto communities, applies equally to their lower as to their intellectual units, but here too we have special factors to consider. True the less gifted, the deficient or the criminal could not escape from the general mass any more than the gifted, but the struggle for existence must have been so acute that the vicious and the diseased would inevitably tend to die out, whilst the less provident and the less intelligent would naturally congregate in the least desirable parts of the ghetto quarter—at the best notorious for its lack of the amenities of life, and would hence be more prone to elimination by endemic and other disease.

We have seen that the ambitious, the strong and the intellectual took refuge in Rabbinism and in so doing expressed in their own life the characteristic dictates of Torah and Talmud—dictates which are peculiar for their extreme insistence on the fundamental Biblical principle "Be fruitful and multiply." "It is the duty of every Jewish man to marry a wife in his eighteenth year, but he who anticipates and marries earlier is following the more laudable course, but no one should marry before he is thirteen," says the Jewish mediaeval code.

The Jewish scholar of the ghetto did not restrict his family, however bare the family cupboard, he knew nothing of modern views of society but he had drunk deep of the wisdom of his forefathers and their views were curiously enough extremely modern for they were essentially eugenic.

And hence it comes about that the Jewish communities of the last thousand years have been steadily increasing their intelligence at the

expense of their lower classes and have existed without conscious class segregation because without the means to make those distinctions visible. In the ghetto the Jew competed but with his fellow. In Russia, and Eastern Europe generally till the war, his competition with his fellow non-Jewish citizens was rigorously circumscribed by the boundaries of the pale and an endless chain of obstructive legislation which not only prevented all true class segregation but perpetuated and enhanced the acquired peculiarities of culture which apart from physical or intellectual differences distinguished the Jewish masses from their fellow citizens.

During the last fifty years an ever increasing number have escaped by emigration from the bondage of Russia and Poland and such emigrants are by reason of their past history and their genetic qualities very different to any non-Jewish group which leaves its old home to seek its fortunes anew.

The outstanding difference and one which in the opinion of the writer outweighs all questions of difference of religion, language and indeed racial origin is that the emigrant Jews by reason of the peculiar circumstances which have been already outlined are on the one hand of a higher intelligence than any other group of emigrants from European people and on the other reach their new home as it were in disguise. The external circumstances make them appear as members of the lower classes whilst in point of fact they are an unsegregated but highly gifted mass deficient in both the extremes common to a normal freely moving population—an aristocracy and a criminal class.

Indeed when once the walls break down, and the Jews enter the stream of the general population, an extraordinary phenomenon is to be observed. The poorest of the poor will often in one or two generations reach the highest position, whether it be in the realm of commerce, law or science. Let any one visiting the East End of London ask himself what chance is there that the Gentile street arab will rise above his station even to one degree, and he must confess that there are 99 to 1 against him. Watch the little bright-eyed Jewish lad hawking newspapers in his ragged clothes. Where will he end? What chance has he of rising? Will he spend the rest of his life between the pavement, the public house and the prison? The chances are 100 to 1 that he will "better himself," and not more than 10 to 1 against his removing himself to a layer definitely higher in the social scale than the one he was born in. The fact indeed has to be realized not only by the external world but by Jews themselves, that today the majority of the Jewish lower classes are not lower classes at all, and that equally the vast majority of the Jewish upper classes are not aristocrats. There are today no Jewish

families of the Cromwellian, or indeed of the first one hundred years of the resettlement left within the fold—whilst in the last one hundred years many of our most distinguished families have so intermarried with the English nobility and gentry as to cease to be Jews except in name. No Jewish families remain long enough in the community after they have achieved solid success in commerce, science, law or state, to effect their conversion from a heterogeneous plutocracy to a genuine aristocracy. The fact is, among Jews we have only groups of people with small or great means. They are of the same blood, and have in the aggregate the same innate potentialities. The poor, or lower, differ essentially from the rich, or upper, in that circumstances have been against them, and that their opportunity has not yet arrived.[2]

In the last decade the London County Council, as well as most of the great municipalities, have awarded scholarships to lads which gradually bring them from the elementary to the secondary schools, and from thence to the university. The Jewish holders of such scholarships are altogether out of proportion to their numbers in the general community. The majority of Jewish undergraduates at Oxford and Cambridge are County Council scholars, sons of poor tradesmen, sometimes of penniless and apparently hopeless individual men whose life has been one long struggle with adversity and Russian oppression. It is too early yet to say how many of these men, sprung from what among non-Jews would be looked on as the lowest class, are going to achieve fame—naturally but few. The majority, however, are already taking honorable and even distinguished places in the professions of law, medicine, teaching, and the applied sciences.

There is, however, another side to this picture to which we must turn. Every headmaster who has Jews in his school, will bear testimony to the fact that they have an altogether abnormally large percentage of clever boys among them; but at the same time he will almost certainly qualify his statement by the observation that they tend to "go off" as they grow older, and cause their parents and teachers much disappointment.

It is undoubtedly a fact that Jewish youths—girls and boys—are precocious. They are quick-witted, and display a general intelligence and appreciation far in advance of their years. The number of infant geniuses among Jews of all, but especially the poorer, classes would be alarming, did not one know from experience that in ninety-nine cases out of a hundred it would come to nothing—to nothing! That is to say, after about the age of fifteen the "wonder child" ceases to progress in the same ratio. His bright-

[2] See I. Abrahams' Jewish life in the Middle Ages, p. 43, for interesting account of the change in Jewish life from an aristocracy of learning to a plutocracy.

ness is seen to be quick-wittedness and not genius. He has rushed the maturation stage of the normal boy, and often enters the arena of life's struggle with a mind already tired and with an initiative already burdened by experience. Moreover, the brain, which has acquired its stores of learning at so rapid a pace, is like to unannealed glass; and when the stress of sexual life is added to the struggle for the existence, it is apt, like a Rupert's drop, to break into a thousand fragments. It is perhaps to this early maturity, this abortive brilliance, with the disappointment which is its outcome, that the great frequency of adolescent depression among Jewish lads is due.

It will doubtless appear to some an extravagant, if not indeed an arrogant, claim to make that the Jews possess an unduly high intellectual standard. But a moment's reflection will show that it has not been made without good foundation. In Great Britain today it is calculated that there are almost 300,000 Jewish citizens, a total which would represent the population of a second-class provincial city.[3] Yet amongst this small group of British citizens are to be found the Viceroy of India, two Secretaries of State, the High Commissioner of Palestine, the Governor of Queensland, three members of the House of Lords, a score of baronets and more than that of knights, about a dozen members of Parliament, an equal number of King's Counsellors, the Vice-Chancellor of Dacca University, the Secretary of the British Academy, some half dozen Fellows of the Royal Society, about double that number of university professors, many distinguished members of the medical profession, one prominent man of letters and several lesser ones, an imposing band of musicians, the commander-in-chief of the Australian forces, several generals and battalion officers, five holders of the Victoria Cross and innumerable recipients of other military honors. Whilst in the industrial and financial world it is only necessary to mention such names as Rothschild, Montagu and Marcus Samuel. A similar imposing list might be made for America, and an even more striking one, as regards the scientific section, for Germany. Let any one picture what the intellectual status of a town the size of Bristol would be with such a population in which such talents were concentrated—what the influence such a city might have in the council of the nation.

If, as has been suggested, the Jewish lower classes are not really lower classes but merely "unarrived groups," the explanation of these facts would seem clear. The Jew of the Russian ghetto generation has not had the

[3] The idea of comparing the total Anglo-Jewish community to that of a city was suggested by a speech of Lord Birkenhead's, the Lord Chancellor, at the Jubilee Dinner of the Jewish Historical Society of England, 1920.

opportunity to sort himself out; it has been impossible for the intellectual and able to take their rightful station in society, and there establish an intellectual caste under permanent and healthy conditions. For in Russia the professions and the higher paths of commerce have been more or less completely closed to them. Instead, they remain mere potentialities in the ghetto mass. The potentiality is there, and we find it in the Russian immigrant today when the shadow is lifted, but the material backing has often been sapped, and there may remain not enough physical *vis a tergo* in many cases to bring it to its full development. With the older Anglo-Jewish families these matters have righted themselves, and whilst they more closely approach to the non-Jewish normal, such outstanding figures as do occur in their midst seem to have more lasting reality than one finds in the poor Russian Jews of the East End where the intellectual average is probably a good deal higher than that of their West End brethren. The startling intellectual precocity exhibited by the poor immigrant Jews in a western atmosphere may be compared to the forcing of mixed seed in a poor soil. Growth is rapid, but the plant feeding only on its own reserves, is pale and soon wilts, leaving room for the weeds to batten where more precious plants failed to make good their hold.

As with the intellectual aspect of the immigrant Jew, so with the material. Settling in the poorer districts of East London, he rapidly improves his status and moves out to the North. From Dalston he migrates to Willesden, and thence to Maida Vale and Hampstead; then a halt is called—so far may be attained by the emigrant himself, certainly by his children; but the later stages of social advancement come slowly and only to the few. And at every removal they take social rank with the corresponding class of their neighbors, though the latter may not have changed their position in the social scale for generations, if not, indeed, centuries.

Thus we see that what in its origin has all the appearance of a lower class, is, in reality, a middle class; the real lower class is composed of those few too feeble and too degenerate to join in the race. They differ even then from the native lower class, as all social workers and criminologists realize. They may be less brutal, but are perhaps more degenerate.

The upper classes of Anglo-Jews are composed of families derived in most cases from western Europe who have been settled here several generations; they are recruited from the most successful of the Russian immigrants, but so far the governance of the Community still rests almost exclusively in the hands of the older non-Russian families.

There is a further point which must be considered if we are to regard Jewish statistics from the right perspective, and to draw from them results

which may be of value to both Jews and others. Immigration from eastern Europe, especially Russia and Galicia, has been a constant and a potent factor in the constitution of the Jewish community. The immigrant, as a rule, arrives imbued with all that is specifically Jewish in the ordering of his family life. As he rises in the social scale, the mantle of the *law* tends more and more to slip from his shoulders. As he assimilates the manners and culture of his surroundings, so does his family life approach that of his neighbors, and the influence of the specifically Jewish becomes more and more attenuated.

Finally, it must be remembered that the Jewish community is a closed one. That is, it takes little or nothing from outside and is inbreeding. In former days inbreeding was doubtless the more close as the communication between the various communal centres was less. This fact has much bearing on all the biological phenomena of the Jews, for any hereditary quality, good or bad, will tend to exhibit itself to its utmost capacity when it exists as a character common to both parents, and the opportunity for such "homozygosity" is obviously greater in a Jewish inbreeding community than in the outside world.

If attention be paid to the vital statistics in those countries where the religious denomination is given in the census returns, it will be found that the Jew presents important differences to those of his fellow non-Jewish citizen.

THE BIRTH RATE

Notwithstanding the religious sanction large families are no longer the rule and the Jewish birth rate is today everywhere notably lower than amongst non-Jews. It approximates to and sometimes even over-reaches in its downward course that of the intellectual and military classes of Europe generally. In general the birth rate varies with the industrial development of the locality. The following figures illustrate the point: In Algiers the birth-rate amongst the Jews is as high as 45 per thousand. In Greater Berlin it was as low as 12 per thousand in 1910. In the same year the general rate was 39.8 in Rumania, 29.8 in Germany, and 19.7 in France. In the Austria-Hungarian Empire the Jewish and Gentile birth-rates vary inversely with the industrial development of the province but in all cases the Jew has the lower rate per 1000 of each class. Thus for 1900:

	JEWS	NON-JEWS
Bohemia	17.85	35.88
Lower Austria	20.51	31.10
Bukovina	29.54	44.81
Galicia	38.01	45.09

In England the writer collected a large number of family statistics amongst the well-to-do Jews of the West End and compared them with those of orthodox Russian Jews in the East End. The West End groups showed a return of about 3 children, the East End over 7 children per married couple.

DEATH RATES

If the birth rate of Jews is less than that of their neighbors, their death rate in every place where it can be calculated throughout the whole world, is also less, and to that there is no exception. Hounded on all sides, and herded together as they are in the Russian pale, living under probably the most insanitary conditions of any people in the whole of Europe, yet we find the Jewish death rate far lighter than that of their neighbors, no matter what conditions they live under. Thus in Prussia in 1908, the Jewish death rate was 13.68 and non-Jewish 17.92. In Russia in 1903 it was 14.5 as against 30 for the general population. Even in Galicia, where the poverty and squalor of the Jews reaches the utmost limit, the death rate is still pronouncedly less than amongst the non-Jews. Between 1897 and 1900 we get the following relationship between the population, births and deaths in Galicia:[4]

	OF THE POPULATION	OF BIRTHS	OF DEATHS
Roman Catholics	48.39	43.53	42.69
Greek Church	42.23	45.42	48.76
Jews	11.66	10.50	7.99

whilst in the cities we find in Lemberg in 1907, the death-rates are:[5]

	JEWS	CHRISTIANS
In Limberg, 1907	21.3	27.65
In Cracow, 1902	20.5	36.9

Turning from the old to the new world, Fishberg is able to give an equally good account of the death rate in New York.

Rosenbaum calculates that the Jews of London as well as Great Britain have an exceptionally favorable death rate.

Some of the most recent statistics are those for Hesse:[5]

[4] Theilhaber. Hygiene d. Juden., p. 129.

[5] Theilhaber. Hygiene d. Juden., p. 148 et. seg.

Number of deaths for every 1000 in each age class (in the case of those under one year, the calculation is made for every 1000 born alive)

	JEWS		GENERAL POPULATION	
	Males	Females	Males	Females
Under 1 year	71.9		160.2	
1–15	6.6	8.7	24.4	24.1
15–40	8.5	11.6	16.8	17.4
40–60	27.9	22.4	37.8	28.0
60–80	138.7	125.0	152.7	150.5
80 and over	193.0	210.8	234.0	240.0

Here it will be seen that the advantage is maintained throughout life's passage and is particularly striking in the earlier years, so that the prospect of life to the Jewish youth or maiden who survives the age of fifteen, is very much greater than to the non-Jew of the same age. Wherever we turn, the same facts are made clear. Particularly is the advantage seen in mortality of infants, (and similar facts are to be found whenever the statistics are reliable), thus: In Frankfurt in 1908, for every 100 deaths that occurred.[6]

	AMONGST JEWS	AMONGST CHRISTIANS
Under 1 year	9.4	24.2
Under 5 years	14.9	32.6

This phenomenon, which appears to be so universally true for Jews, has naturally excited considerable speculation, but before venturing on any explanation it would be well to consider whether Jews exhibit any special reaction to those diseases which occasion the majority of deaths.

INCIDENCE OF DISEASE AMONGST THE JEWS

One may omit all reference here to the legends and tales of the immunity the Jews were said to enjoy to plague in the Middle Ages—for more Jews lost their lives in mediaeval pogroms because of this supposed immunity than they ever could have by the pest itself.

At the outset it is necessary to make good two negative points: (1) That the Jew, no matter in what part of the world, is free from alcoholism, and this freedom has been less effected by his assimilation with the west, than

[6] Theilhaber, p. 158. Die Sterblechkeit d. Juden. Hygiene d. Juden., p. 113. Dresden, 1911.

any other trait peculiar to the race. It is only necessary to note that in the London Hospital a Jewish alcoholic is one of the rarest events of the year, whilst the Board of Guardians which deals with some 1100 new cases a year, finds it unnecessary to make the smallest provision for destitution arising from alcoholism.

Saleeby speaking of the Jews says "That the practically complete immunity of their parenthood from alcohol is one of the great factors that explain the all but unexampled persistence of the Jews, and their present status in the van of the world's work and thought."

The second point is that there is infinitely less syphilis amongst Jews than amongst others. In fact amongst observant Jews it may be discarded as a factor affecting their vital statistics, and even amongst Jews who are no longer influenced by Judaism as a code of life, the incidence of this fell disease is still low. This relative immunity is vouched for in Russia, Prussia, London, and to a lesser degree, in America, but I am unable to find any statistics bearing on the matter.

It is conceivable, and not at all improbable, that the absence of alcoholism is really a racial and innate hereditary quality, for alcoholic drink, as such, is by no means disbarred by Jewish custom or religion and asceticism has never been ranked as a Jewish virtue.

With regard to syphilis, there is no reason whatever to presuppose a racial immunity. It is owing entirely to the Jewish traditional family life and to the relative higher standard of education in the Jewish masses that the race is spared this scourge. It is possible that in the event of opportunities for infection, circumcision is some protection, but there seems to be no reason to believe that the relative immunity is due to anything other than environment. Recent reports would seem to show that syphilitic infection is gaining ground among the Jewish masses.

PHTHISIS AND TUBERCULOSIS IN GENERAL

It is in respect to tubercular diseases that the Jew exhibits the most extreme paradox. A town dweller of generally inferior physique, living at least in many parts, under the most profoundly unhygienic conditions, pursuing occupations which for the most part confine him to close workrooms, it would be thought that the Jew would be an ideal victim for the ravages of the tubercle bacillus. However, there is not the slightest doubt that, contrary to all expectation, he proves himself more resistant than any of the peoples amongst whom he lives.

We have statistics dealing with this from Budapest,[7] where in 1901–1905 the mortality per 1000 of each class for pulmonary tuberculosis was:

Catholics	44.15
Jews	20.06
Persons of other faiths	39.27

In Vienna during 1901–1903, for all forms of tuberculosis: per 1000 of each class:

Catholics	49.6
Protestants	32.8
Jews	17.9

whilst of pulmonary tuberculosis there succumbed:

Catholics	38.8
Protestants	24.6
Jews	13.1

In Tunis, 1894–1900 the mortality per 1000 of each class was:

Arabs	11.30
Europeans	5.13
Jews	0.75

Attempts to explain this immunity have been made from many different directions. Some urge the absence of alcoholism, and correctly so, as robbing the tubercle bacillus of a most valuable ally. Others regard the immunity as due to the dietary laws; this argument, however, is quite untenable, for if humans are affected by bovine tubercle at all, it is certainly not through meat, but through milk, and this in the earliest years of life at a period in which the Jewish mortality is so extremely favorable. It has been regarded as a strict racial character, and in one sense this is probably correct. For almost two thousand years the Jews have been subjected to an environment altogether favorable to the development of tubercular disease, and when one realizes how, in recent days, the susceptibility to tubercle has been shown to run in families, it is not unreasonable to suppose that the susceptible strains in the various Jewish communities have been killed out during the ages by tuberculosis of one form or another, a result easily attained, seeing that tubercle generally claims its victims young and before they themselves have reproduced their like. In that way, the Jews of today are more or less free from susceptible strains and such individuals as fall

[7] Fishberg, The Jews, 1911, pp. 287–288.

a victim to tuberculosis are those who have been subjected to some very adverse influence. If this explanation be the correct one, then immunity to tubercle is not a racial character originally belonging to the Jew, but one which he has won by the continuous selective action of the tubercle bacillus itself. This immunity must not, however, be looked on as an acquired character, nor is its heredity any argument in favor of the heredity of acquired characters. On the contrary, the immunity exhibited by the Jew is rather a negative character which is due to the extinction and the removal from the population of those possessing the heritable quality of susceptibility to tubercle.

PNEUMONIA

Pneumonia, especially amongst children, is certainly no less common amongst Jews than others and has been stated to be more frequent.

DIABETES

Diabetes, notably the more chronic form, is more common amongst Jews than others and as it is probably inherited and at the same time does not often kill during the child-bearing period, it naturally tends to hold its own or actually increases in an inbreeding community such as the Jewish one.

NERVOUS DISEASES

Jews certainly suffer from the same forms of nervous complaint to a much greater extent than others; neurasthenia, hysteria and melancholia are the more common troubles. On the other hand, epilepsy is very much rarer, and general paralysis and locomotor ataxia are less common, as might be expected when the rôle that alcohol and syphilis play in the production of these diseases is remembered. Functional nervous complaints are undoubtedly on the increase amongst Jews as amongst all other town dwellers.

In Germany the increase of Jewish patients in the lunatic asylums is alarming, being three and a half times as great as their proportion in the general population would warrant.[8] The greater part of the increase is amongst those over fifty years of age and is evidence of the strain and tension induced by the constant fight to achieve success in a partly alien and almost wholly hostile atmosphere. In addition the spread of venereal disease amongst the Jewish commercial travellers and students is said to be greatly on the increase and will if a fact, be evidenced by the increasing toll of nervous degenerates.

[8] Theilhaber J. Untergang d. Juden, p. 140, 1911.

Defects of eyesight are known now to be hereditary and as Jews intermarry it is only to be expected that a greater proportion of them suffer from defective vision than do the general population. There is one rare and fatal disease affecting children only, known as amaurotic idiocy. Seventy cases are recorded in 35 families and all but one were Jews. It seems obvious that it must take its origin in some combination of hereditary factors of which one or more occur only in a Jew. It is an argument in favor of the ethnic differentiation of the Jew.

SUICIDE

Suicide was at one time, and still is in eastern Europe, one of the rarest occurrences amongst Jews. Today in western Europe a great change has taken place. In Prussia[9] since 1849–1855, whilst the number of suicides amongst Catholics had doubled by 1907, amongst the Protestants it had increased one and a half times, and amongst Jews no less than eight times.

Suicide is but one of the expressions of the strain of modern city life to which the Jew, starting at the bottom rung of the social and economical ladder he is so anxious to climb, would be particularly subject. His susceptibility to nervous disorders is doubtless an associated phenomenon.

VARICOSE VEINS AND FLAT FEET

During five years of military service the writer had exceptional advantages for observing the incidence of these two troubles amongst the troops. Three years were spent in examining and treating the ordinary recruits of the British Army of whom tens of thousands came under notice. The prevalence of varicose veins of the legs was very great, probably reaching as high a figure as 1 in every 6 men, and was one of the most frequent causes of trouble.

Flat foot, on the other hand, was comparatively rare and not more than 1 in 40 suffered in any marked degree. During the last two years of the war, the writer acted as Medical Officer to the Jewish battalions and had over 5000 men pass through his hands. In the Jewish force the incidence of varicose veins and flat foot was inverted. Whilst the latter was extremely common and present to a greater or less degree in quite 1 in every 6 men, not more than half a dozen cases in all of varicose veins were noted and only one came under observation as a cause of disablement.

[9] Fishberg, The Jews, p. 383, 1911.

CANCER

Jews have no immunity to cancer in general, but there is one form, viz., carcinoma of the uterus, which is exceptionally rare. It has been thought that this may be due to the sexual relations which have been referred to previously. It is possible, but we have no satisfactory proof of it. Auerbach[10] gives for Budapest—cancer of uterus: Jewesses 8.6, Christians 24, per 10,000.

CONSIDERATION OF THE MORTALITY STATISTICS

We are now in a position to offer a few suggestions as to the meaning of the extraordinary mortality returns. It has been noted that it is the one outstanding feature in Jewish bio-statistics. The lower death-rate is so general and so considerable in amount that it cannot be a matter of chance. The considerations which led one to regard the immunity of tubercle as due to the gradual selective action on the part of the tubercle bacillus, apply in no small measure to the general mortality returns. The lower death-rate at all ages, especially after the first year, means that the Jew offers greater resistance throughout life to all the inimical influences of the environment, that he is on the whole a tougher and a more resilient specimen of humanity, and no one, taking his general history into consideration, can doubt that this is a fact. To what extent Jewish blood per se is capable of transmitting this character, is evidenced by the figures which Auerbach[11] brought forward (though with the opposite object), viz., the mortality of Jewish illegitimates compared with Jewish and Catholic legitimate and illegitimate children.

At Budapest, of every 1000 born alive in each class, there died in the first year,

	JEWISH	CATHOLICS
Illegitimates	143.4	176.8
Legitimates	92.2	161.0

notwithstanding the fact that the unfortunates are even more declassé in a Jewish milieu than amongst the general population.

Seutemann's investigations of the infantile mortality amongst children of officers and the upper classes in Prussia—whose children there is no reason

[10] Quoted by Fishberg, The Jews, p. 312.
[11] Hygiene d. Juden., p. 152.

to suppose are not at least as well treated as Jewish children of the same class —exhibit a mortality compared to the Jews as 1.7 is to 1—which would seem to show perhaps unequivocably that it is nature rather than nurture which is on the side of the Jewish suckling.

If then it is true that the Jewish infant even before birth is born into the world a more resistant organism than his non-Jewish competitor, that is not his only advantage. Gynæcologists of experience are of opinion that Jewish women have on the average considerably less obstructed or abnormal labors than others, which is in harmony with the assertion made by several authors that there are relatively less still-births in a Jewish community, as well as with the fact that rickets, the main cause of deformed pelves and absence of obstructed labor, is a rarity even in the poorest classes of Jews, compared with its incidence amongst the children of the non-Jewish poor. Be this as it may, when once the child is born the scale is again weighted to its advantage by the prevalence certainly amongst the poorer classes of breast-feeding. When it is weaned it takes its place in a home where the mother is always on duty and not working at the mills. Of late days, however, a change is setting in, and married women in the east-end of London are obliged to an increasing extent to seek employment; fortunately the community has erected crêches which to some extent repair the damage.

When the child is old enough to run about, again it has a certain advantage over its Gentile brother for, unlike him, it is rarely sent out to play on the streets—at least not all unprotected. Prior to 1904 the writer was for several years in a position to judge of the frequency of accidents bringing about the death of young children in the East-End, and he was surprised to note how rarely a Jewish child was the victim of a street accident, and on the other hand how many more Jewish children than Gentile suffered from burns and scalds, which certainly suggests that the children are kept to the house rather than allowed to wander at large in the crowded thoroughfare. The figures for 1000 consecutive post mortem examinations at the London Hospital in 1904 were made up of:

	JEWS	NON-JEWS
Number of examinations	217	783
Inquests on account of burns	22	21

which shows a great excess in Jewish families of such deaths. The number of Jewish post mortems is relatively much less than the Jewish population justifies, owing to the prejudice against such examinations amongst the immigrant population. But all deaths by accident are, by law, brought to post mortem.

From childhood onwards the Jew has further two marked advantages: his parents are never alcoholics and he himself rarely enters the more dangerous trades or occupations.

Again the statistics of the London Hospital for 1904 throw light on this.

	JEWS	NON-JEWS
Inquests on account of violence	11	33

Numbers which tell their own tale when one recalls the large Jewish population which the hospital subserves.

When the Jew has reached adult life he at least starts with a considerable advantage in hand and it rests with him whether by adhering to the old and well tried customs of his people he adds to them and gives to his children the same opportunities that he has enjoyed.

It is not proposed to discuss the heredity of the physical characters of the Jewish people. The writer has already expressed his views[12] and given the evidence for his belief that the facial types of the Ashkenazic as opposed to the Sephardic or Spanish section of Jews may be referred to their triple source of origin, the Semitic, the Alpine and the Mediterranean races, or in terms of history, the Arab Bedouins, the Hittites, and the Philistine. It is referred to only to bring to the notice of anthropologists and others a curious phenomenon which is apparently taking place today.

In Palestine there are two bodies of Jews, the older groups consisting of persons who leave Europe for strictly pietistic motives, who supported by religious and charitable funds, spend their last days in prayer and meditation looking on the Holy Land rather as a chosen place of sepulture than for living in. And there is another group—the colonists who come to Palestine to strike out a new life to win back the barren land and rebuild the Jewish people in the land of Israel.

The writer spent a year in Palestine and was much struck by the distinction in facial type of the two groups and referred to it in a recent book.[13] Since then other observers have noticed it. The old pious or Haluka Jews, as many are called, are mainly people with the facial type which is commonly called Jewish and which is really Hittite with more or less Semitic admixture. The colonists are very largely non-Jewish looking, they are much

[12] Salaman, Redcliffe N., Heredity and The Jew, Journal of Genetics, vol. i, no. 3, September, 1911; Eugenics Review, October, 1911.

[13] Palestine Reclaimed. Routledge, 1920.

more of the type that has been referred to elsewhere as pseudo-Gentile (Philistine) and it would certainly appear that this group, which has been on the land now about forty years, is in process of segregating out a distinct though not new type which may possibly characterize the Palestinian Jew of the future. If one is right as one believes in one's facts, then we have possibly here a case where a physical facial character is associated with a mental one, for the colonists are adventurers and men of action, the other group are pietists and men of reflection. Is it possible that the facial types which some fancy characterize today the Anglo-Saxon colonists of Australia and Canada may have their origin in similar causes?

Many of the subjects with which both the science of bio-statistics and of eugenics deal are those on which Jewish law, and what is more important, Jewish practice, has pronounced its views and dealt with from the earliest times. It is, of course, well known that Judaism regards the body as a fitting accompaniment, and not a drag, to the development of the spirit; and it is fitting that to it the deepest reverence and the most profound thought and care should be dedicated.

It is not surprising, therefore, to find that there exists in Jewish theological writings from all times, a vast mass of literature dealing with all those specific questions which concern not only the life and interests of the body politic, but deal with the most intimate concerns of the individual, especially in his relation to the family.

The Jew therefore differs from all other people in having always had an appreciation of much that modern eugenists advocate. Wisdom was preferred to riches, peace to strife, a pure and simple home life the great ideal. In evidence of this statement, one might refer again to the almost total absence of alcoholism and the equal rarity, i.e., up till about fifty years ago, of venereal disease amongst Jews.

In dealing with bio-statistical facts as they concern Jews, there is always this two-fold aspect under which they may be discussed, one religious or traditional, the other racial; and controversialists have built on this basis a contention in many ways parallel to that which rages among biologists on the validity of the inheritance of acquired as opposed to innate character. Though not denying to the Jewish religious code a very powerful and on the whole beneficial influence, it would be idle to minimize the more potent influence that the unique environment of two thousand years has had as a selective agent on the racial qualities inherent in the original stock.

Today two tendencies are at work amongst the Jewish people throughout the world, the one centrifugal and assimilative, the other centripetal and self-assertive. The assimilative tendency is a movement which would

break down all those barriers, whether erected by Jew or Gentile, which interfere with their fullest coöperation in the state, and which forces the Jew, perhaps unintentionally, daily to sacrifice more or less of what is specifically Jewish in his life, to his ideal of the general welfare. In this process many individuals may be lost to the community whose very existence indeed may be threatened thereby. It is only fair to add, however, that the liberal synagogue claims that it will, in course of time, be able to resist the less desirable effects of assimilation whilst preserving the identity of the smaller community. It is difficult to appreciate how this can be effected.

The opposite tendency, which has expressed itself both in orthodoxy and in Zionism, is a centripetal and consolidating force which, by instilling into an artificially depressed class a sense of personal worth and dignity and a high political ideal, is of undoubted value, not merely to themselves but to the state. Nor must it for a moment be implied that the Zionist is not ready to serve to the utmost the state of his adoption: he is only unready to sink his identity in hers.

Neither the assimilative nor the orthodox or Zionist tendencies are immediate factors in relation to the state. The followers of both are equally ready to serve her, the difference is that as the assimilative party is constantly suffering attrition, it tends to pass in course of time by direct fusion, now sooner, now later, into the general population, in contrast to the orthodox and Zionist elements which tend to retain their specific and distinctive structure. Whether the state gains more by the fusion of a small and gifted minority in the general population than by enjoying the concentrated output of a highly self-conscious group, is a very difficult question. If we could assume that the specific and hereditary intelligence of the Jew were controlled by Mendelian factors, it is highly probable that the decision should be against amalgamation when the minority is as small as it is in most countries. Whilst where the numbers of the minority group approximate to those of the rest of the population, fusion might well be in the best interests of the whole. But in face of our present ignorance, it is obvious that we must abide by the decision of the individuals themselves.

The Jewish problem in civilized countries really narrows itself down to the question of the admittance of emigrants from eastern Europe. There has been a tendency to raise barriers against their admission. There would appear to be no question more suitable for the consideration of eugenists than this. The whole problem is a relatively simple one: are these emigrant people of value to the state or not? Do they bring promise of greater gifts beneath their tattered garments than the jaundiced eye of a relieving officer can appreciate?

In this thesis an attempt has been made to present in an unprejudiced manner the more important considerations which must guide any serious enquiry as to the advantage or otherwise of encouraging Jewish immigration. These considerations may be summed up as follows:

a. The Jewish masses are of a considerably higher degree of intelligence than any random European group of the same number.

b. The Jewish masses of eastern Europe are unsegregated as to class, and hence calculations based on the apparent social status of emigrant Jews are entirely misleading.

c. The Jewish mass is deficient in extremes: it lacks both a real aristocracy and a real criminal class: it is in reality a middle class with a preponderating proportion of intelligentsia.

d. The Jews exhibit a birth rate lower than the general one, but similar to that of the professional classes of Europe. The death rate, on the other hand, is uniformly much lower than amongst their fellow citizens.

e. Jews are almost free from alcoholism and are far less infected with syphilis than most civilized people.

f. Whilst the incidence of nervous disorders is higher, that of tubercular infections is notably lower, than amongst non-Jew. In respect to other morbid affections, the differences, where any, are insufficient to have a selective value in either direction in a modern state.

If these conclusions are correct, then there would appear but one answer to our question. The Jewish emigrant is a bearer of qualities which are of essential value to any civilized state.

EUGENIC PROBLEMS OF THE SLAVIC RACE

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The aim of this paper is to point out some fundamental eugenic problems of the Slavs[1] which could be treated scientificially on the basis of the data dealing with the influences which improve the inborn qualities of the Slavic tribes—Russians, Poles, Czecho-Slovaks, Serbo-Croats, Slovenes and Bulgarians.

These data about the Slavic eugenics could be grouped as follows.

1. Historical facts about ancient and modern Slavic contributions in civic usefulness to the population and humanity at various times.

2. Vital statistics of the Slavic race.

3. Statistical data about the highest aim of the Slavic old and new eugenics—*Moral Preservation.*

1. It is an historical fact that the Slavs always toiled for others, suffering and dying for the Christian humanity. They have been more than ten centuries the bulwark of the Christendom against the Turks, Huns, Tartars, Avars and other tribes of Mongolian origin. The Mongolian conqueror, Baty, invited by the German Emperor Frederick II (Hohenstaufen),

[1] Many prefer to have the Slavic word "Slavyane," "Sloveni," "Slavi," "Slovane," "Sloveienim" translated *Slavonian* for *Slavonic* rather than the Slavs, as the latter is calculated to mislead (slaves,—the foreign words: *der Sklave, sclavus, esclave, schiavo, esclavo* or the English *slave* have nothing to do with the Slavic root "slovo" or "slava" meaning *word* or *fame* respectively), but as there is a Serbo-Croatian province called *Slavonia* the confusion is very hard to avoid. Not only is there a great ignorance of Slavic Race among foreigners, but as always is the result of ignorance, great misunderstandings. The popular notions about the Slavs are sometimes not only imperfect but absurd. Even the text-books for our American elementary schools are not safe from such a delusive conclusion. So, for instance, J. I. and A. T. Gordon, in their "Elementary History of the United States with Civics" (New York, Merrill Co., 1904, Book Three, p. 57) use the following German explanation of the Slavs: "The name slavery is derived from a race still known by the name of Slavs, whose home is in eastern Europe. They were overcome by the Romans a good many hundred years ago, and were compelled to be servants and do their work." The Slavs, who are just as pure "Aryans" (Caucasians or Indo-Europeans) as their real cousins—the Latins, the Celts and the Anglo-Saxons, have exactly the same claim as these other nations to be counted Europeans.

invaded—in 1224—and devasted Russia and other Slavic countries. Happily Baty was beaten at Rijeka (better known as Fiuma) in 1245 by the gallant Serbo-Croatians, but the Asiatic hordes have periodically since bled white the Slavic lands. Later on plundering kings encouraged the Turks, who bled white the Serbs and other South-Slavs and were surrounding already Munich, when the Polish Hero-King, Fan III Sobieski, crushed their main forces under the wall of Vienna in 1683. Here the noble-minded Poles finished what the Serbs attempted in 1389, and were similarly rewarded for their service to Christian civilization. Europe has never repaid the great debt it owes to the Serbs for checking at the sacrifice of their own liberty that influx of barbaric Turks. Only half a hundred years ago Serbia was under the yoke of the Asiatic Turks. The Slavs sacrificed themselves for Europe, and gloriously fulfilled the duty imposed upon them by the moment, proving themselves the "*propugnaculum reipublicae christianae, antemurale Christianitatis.*"

Imagine what a vast difference it might have been, to the detriment of Western civilization and culture, if the Slavs had not for more than a thousand years resisted the westward march of Asiatic barbarians on many a glorious battlefield, immortally inscribed in the history of mankind. Who may know what could happen if the Slavic heroic guardians did not protect Europe with lances when it chattered idly, disputed over indulgences, lost itself in subtleties? Was it really possible for the women of France and Germany to spin their distaff peacefully and for their men to study theology if the Slavs, keeping sentry, only a step from the barbarian, were not on the watch, saber in hand? Who may know if the Latins, Gauls and Anglo-Saxons would have advanced from the darkness, and taken the world with them as they did, if it were not for the heroic Slavs battling the mighty legions of Satan on the eastern and southern borders of Europe?

In one word, it is an historical fact that while the majority of the European people had the good fortune to continue their spiritual and intellectual development, under the vivifying influence of classical antiquity, to create the Renaissance of Art and Letters, the Slavic people had to fight terrifically with the infidel in order to save the peaceful cultural development of their Christian brothers in Europe. But in spite of having been handicapped by geographical climate permitting little indolence and little of the *dolce far niente*, the Slavic Race has a right to raise its protest against the too absolute decree of exclusion; for although it did not hollow out the channels of the double movement—*Renaissance* (or intellectual movement) and *Reform* (reformation or religious movement)—from which our Modern Era issued, the Slavs opened it into two directions. In the first place they gave the

world a Copernicus before Italian gave a Calilei or German a Kepler or the the British a Newton. In the second place the Slavs gave the world a Jan, before the Germans gave it a Luther. They already have given proofs of their inborn capacity to develop, of their vital power in all domains of public life. The Slavs have competed with the world in their intellectual productivity and invention. The editor of *Science and Invention* says the following about the greatest Slavic mind of the present, an American citizen of the Serbian birth: "Niko la Tesla, in the opinion of authorities today, is conceded to be the greatest inventor of all times. Tesla has more original inventions to his credit than any man in history. He is considered greater than Archimedes, Faraday or Edison. His basic, as well as revolutionary, discoveries for sheer audacity have no equal in the annals of the world. His master mind is easily one of the seven wonders of the intellectual world." Note their poetic inspiration (after the Greeks the Serbs are the only people who created a new Iliad and Odyssey whose form and ethics surpassed all), their magnificence in art of every kind, and the work of the savants who by their labors and by their researches have contributed to lift the level of daily life. Struggling constantly against the German imperial aggression the Slavs accepted from the enemy a good system of organization which is a good asset for the future political unity of the Slavic Race.

The Slavic folklore, legends and popular poetry show clearly how the Slavic nature is extremely democratic, remarkable for the profound love of peace and religion of deeds, capable, more than other, of receiving the noble work of the Gospel, which leads men toward perfection.

The Slavic coöperative instincts, shared by all social animals, is the basis for all civilization and industry. The Slavic peasant, both by temperament and by habit, responds naturally to a coöperative effort, and it is right here that his genius finds self-expression, especially in the Russian "Mir," "Svietelka," "Artel" or in the Serbian "Zadruga," "Moba," "Pozaymitza," "Esnaf" and "Bratstvo"—all social-economical institutions which are totally opposite to the spirit and deeds of the Martian gospel and life of the Bolsheviki.

Such high social-economical and religious-moral institutions of the Slavic people improved the Slavic racial qualities in such a way that almost all great Slavic writers, artists and scientists dislike the popularly misunderstood side of Darwinism, and are trying to show that the *Mutual Aid* is a great factor in evolution, for it shows that the struggle for life is not to the strong always, but sometimes to the weak when they are the fittest for rendering to the strong. Tolstoy cried loudly that the sole meaning of life is to serve humanity. Vladimir Solovyev says that no nation can live in

itself, by itself and for itself. Musorgsky claims that to be fed upon humanity is the whole problem of art, and John Hus begs everybody to "Hear the truth, learn the truth, love the truth, speak the truth, keep the truth, guard the truth until death. Another Slavic writer speaks rightly: "The ideal of the masses is Christ. At the supreme and fateful movement of national life our people ever decide, and have decided, every matter in the Christian spirit."

This Slavic conception of humanitarian love is beautifully expressed in Comenius's "Tansophia Christiana" long ago in the seventeenth century. In one word, the humanity of the Slavic people is rich and generous, as is shown in its real Christian charity and its real Christian sympathy. They are the most pacific, the least warlike, of the European nations. The banner which they raise has the words *Unity* and *Independence* on the one side, and *Liberty* and *Equality* and *Humanity* on the other.

2. The Slavs are very prolific people, especially the Russian and Balkan Slavs. Were not the numerical strength of the Slavs decimated by a very high death rate (Petrograd has the highest mortality rate of any large city in the entire world) there would be no limit to estimates of the Slavic population (see tables 1 and 2). William T. Stead predicted some fifteen years ago the eventual supremacy of the Slav. "If for no other reason the Slavs will rule by mere force of numbers," he wrote after a detailed statement of numerous other incontrovertible bases for his prophecy. Professor Lubor Niederle of Prague University estimated very conservatively when he placed 157,000,000 as the figure for the Slavic population of the world in 1910. It is not too liberal an estimate to place the figure for the Slavic population of the world in 1920 at 175,000,000. Some students of statistics who consider themselves conservative have made the figures 200,000,000. But to avoid extremes we will stick to the the former estimate. These 175,000,000 of Slavs represent almost one-tenth of the total population of the world and occupy about one-sixth of the earth's land surface (all but a fraction of this large area is included in Russia).

Old age among the Slavs is very popular. Statistics show that old age is the greatest in Serbia, for she is a country of centenarians. One man in every 2,600 reaches one hundred years. Ireland ranks next, with one in every 8,130. Out of every 43,000 Spaniards one is a centenarian. In England, Scotland and Wales one in 177,000; in France, one in 180,750, and Switzerland, with all its reported healthiness, seems not to possess one.

Physical conditions under which the Slavic people, especially Russians, live involve a greater percentage of mortality than in any other European country. It amounts to about 34 per thousand. But those who survive

are really the fittest, for they give birth to a healthy and prolific nation. The figures in tables 1 and 2 are very instructive, for one of the most certain indices of the potential strength of any nation is its vital statistics. The decrease of the population is a sign of degeneracy. It is rightly said that the slow growth or stability of the number of inhabitants shows clearly that a nation in question is certain of outliving the most potent powers of destruction, by the simple force of its quiet strength. The intensive growth in

TABLE 1

NUMBER	COUNTRIES	MILLIONS OF SOULS IN THE YEARS OF			
		1789	1801	1815	1890
1	France	26	26	30	38
2	Great Britain and Ireland	12	16	19	38
3	Germany	28	25	30	49
4	Austro-Hungary	18	25	30	43
5	Italy		18		30
6	Russia in Europe	25	40	45	100*

* 145 for 1910.

TABLE 2

NUMBER	COUNTRIES	NUMBER OF BIRTHS PER 1,000	YEARS OF OBSERVATION	NUMBER OF DEATHS PER 1,000	YEARS OF OBSERVATION
1	Russia in Europe	47	1903	29	1903
2	France	29	1905	21	1905
3	United States	22	1908		
4	Belgium	25	1907	16	1907
5	England and Wales	26	1908	15	1908
6	Switzerland	27	1908	16	1908
7	Denmark	29	1908	15	1908
8	Holland	30	1908	15	1908
9	Italy	32	1905	22	1905
10	Germany	33	1908	19	1908

numbers of a nation indicates the fact that a desperate struggle for life is in progress with some degree of opposition and that this nation is emerging as the victor from battle.

3. The outer nature of the great European valley, giving to its inhabitants no comfort in temperature, no winds and stimulating climate, has forced the great bulk of the Slavic Race to look to its own inner self to find impressions which will uplift the human soul. It is not an exaggeration if we state that the Slavs are characterized by an inclination toward inner observation,

inner analysis, especially toward *moral introspection*. External trimmings do not very much attract the Slavs. They do not show a desire to advance themselves in the material ways that come to mean so much to the western world. They are able to live without the comfort of Englishmen, without the fineries of the French; they are satisfied with simplicity; they do not care for luxury and above all things they like a warm soul and a sincere heart. A careful observation of international galleries of paintings will involuntarily disclose the pale colorings of the Slavic paintings (e.g., paintings of Vasili Verestchagin), but, on the other hand, their psychological insight is found in the works of Slavic master-writers (Tolstoy, Turgenyev, Dostoyevsky, Artzibashev, Gogol, Sienkiewicz, Mrckiewicz, Lazer K. Lazarevich, Isidora Seknlich, etc.), where the deep psychological analysis comes first, and then the description. Accordingly, the *Mental* (inner) *Culture*, in contrast to the national (outer) culture, is the most fundamental trait of the Slavic national genius.

To prove this Slavic habit of moral analysis we may use also the statistical data on international *suicides*, *crimes*, *felony* and *insanity* (see tables 3 and 4).

We have seen how large a percentage of Russian people die in the struggle with physical nature. The mortality due to sickness exceeds the death cases of all other European nations. But it is wonderful to see how the same people show an immense power of moral self-preservation which is saving them from such great evils as suicide and crime. A comparison of suicides in different countries shows that the Slavs are least affected by such a fact. The existence of suicide is looked upon, in Western civilization, as a sign of the presence of maladies in the body politic which whether remediable or not, deserves careful examination. Of course, it is impossible to compare western civilization in this respect, with, say, Japan, where suicide in certain circumstances is part of a distinct moral creed. In Christian ethics and Christian law it is wrong, indeed illegal, as a *felo de se*, self murder.

The phenomenon of suicides has at all times attracted attention from moralists, sociologists, anthropologists, psychologists and educators. Why do the Slavs of Bohemia and Moravia kill themselves eleven times more often than their Slavic brothers in Russia? That such a great difference between the results in the table 3 is due not to degree of school education of the inhabitants and other external causes, but rather to the nature of the races is shown by the fact that where the Slavic people are mixed with Germans the numbers of suicides is not equal for both nations. So, for instance, the Slavs of Dalmatia (less than 10% are non-Slavs here) show, in 1896, only 14 suicides per million. On the other hand, in Bohemia and Moravia where there are many German settlements, the number of suicides is very

high. The Czecho-Slovaks of Bohemia and Moravia do not differ ethnologically from the Serbo-Croats of Dalmatia, but the suicide rate of the one group is 158 per million, while that of the other is only 14 per million inhabitants. It shows the German influence on the Czecho-Slovaks. Morselli, Guerry, Mayo-Smith and other statisticians show that those parts of Prussia which have the purest Germanic blood give the highest rate, while the eastern provinces, with an intermixture of Slavic blood, show the

TABLE 3

NUMBER	COUNTRIES	PERIOD OF OBSERVATION	SUICIDES IN 1,000,000 (ANNUAL NUMBER)
1	Saxony	1902–1906	392
2	France	1900–1904	227
3	Denmark	1901–1905	227
4	Japan	1905	209
5	Prussia	1902–1906	206
6	Switzerland	1878–1882	201
7	Baden	1878–1882	198
8	Austria-Hungary	1902	173
9	Wuertemberg	1878–1882	164
10	Sweden	1900–1904	147
11	Bavaria	1902–1906	141
12	United States	1907	126
13	Bulgaria	1900	118
14	Australasia	1903	101
15	England and Wales	1900	100
16	Belgium	1878–1882	100
17	Norway	1901–1905	65
18	Scotland	1905	65
19	Italy	1901–1905	64
20	Ireland	1906	34
21	Finland	1900	30
22	Russia in Europe	1900	25
23	Portugal	1906	23
24	Spain	1893	21

lowest. But self-destruction in Germany is almost as common among children as among adults, which seems to be due, rather, to an inherent suicidal tendency in the German nation. This tendency is non-existing among the Slavic men, women and children. The hundreds of the Russian women who between 1877 and 1885 were exiled to eastern Siberia for political offenses had no shelter or protection whatever, and must necessarily have suffered more than the exiled men from the

hardships and privations of banishment. And yet, the number of suicides among the men was about five times greater than it was among the women.

This infrequency of self-destruction among Russian women, as compared with that among men, may be due not to their comparative immunity from suffering, but (1) from a greater power of patient, passive endurance, when there is no fight to be made; (2) from a mind and heart that are more influenced by sentiments and beliefs that may be called religious; (3) from a peculiar capacity for self-restraint and self-preservation, based on the maternal instinct. And then it is also interesting to note an important fact according to which the proportion of military suicides is the greatest for Russia: 11 to 1, while the same proportion for Austria-Hungary was 10 to 1; for the United States, $8\frac{1}{2}$ to 1; for Italy, 5 to 1; for England $2\frac{1}{2}$ to 1, and for Germany it is $1\frac{1}{2}$ to 1.

TABLE 4

NUMBER	COUNTRIES	ANNUAL NUMBER OF SUICIDES PER 1,000,000					
		1851–1855	1861–1865	1871–1875	1878–1882	1887–1891	1901–1910
1	England and Wales	64	66	66	75	81	90
2	Prussia	130	122	134	166	197	202
3	Saxony	240	264	299	392	322	326
4	France	100	125	150	180	218	224
5	Belgium		55	68	100	120	137
6	Italy		28	35		52	71
7	Denmark	272	288	258	251	253	96
8	Sweden	71	76	81	92	119	151
9	Norway	107	85	73	69	66	51
10	Russia in Europe	29	31	30	30	30	31

A careful study of suicides during a long period of time in both Slavic and non-Slavic European nations, shows a very interesting fact, that the number of suicides in Russia for the last fifty years is almost the same, while for other European countries it has been increased from 30 to 40 per cent as it is shown in the table 4.

Judging from the figures and statistical interpretations of these data, we may conclude that the suicides committed by the Slavs are mainly due to physical causes, while the causes for the nations of Western Europe are moral vices. The main causes for the Slavic suicides are arranged in the following order: First comes poverty (the main cause), then disease, after that family troubles and lastly (least), mental resignation.

But regardless of the proofs for the causes of suicides, it is a fact that the Slavic race is characterized by a high moral endurance. It recognizes the

fact that in this world the human spirit, with its dominating force, the Will, may and ought to be superior to all bodily sensations and all accidents of environment. This great asset of Slavic nature, moral preservation, saves the Slavic race from the terrible crime of suicide, it gives it the power and energy to struggle against mental resignation. This highly developed power of patience and suffering, combined with the ability to transform a sudden storm of the soul into the quiet feeling of melancholy, enables the Slavic race to be great in adverse circumstances and furnishes them with a blast which serves as a mental equilibrium in dangerous moments of life. Lack of sentimentality, submission to fate and willingness to experience a failure when it is necessary, of course, is the most characteristic form of Slavic suffering. Suffering and deep thinking saved the Slavic race from moral and physical death in their struggle with the terrible elements of nature; the constant mental analysis and introspection saved the Slavic race from crimes which pervade the atmosphere of their cultured neighbors. No race knows better than the Slavic how to suffer and what suffering means. This suffering makes the Slavs compassionate. Today every Russian muzhik (peasant) shows unconsciously his Slavic passive resistance to the godless régime of the Bolsheviki, and every one knows that such a great suffering is the cause of progress. Behind that gigantic passive resistance there is a great meaning for the future humanity, a meaning which is very hard to be grasped by those who do not know well the soul of the Slavic race. A Russian author, Nicolay Berdyaev, says in his essay entitled, "The Soul of Russia."

> That which has worked ceaselessly in the depths of the Russian spirit is no longer to be provincial and confined in its manifestation: the Slav Race with Russia as its head is henceforth called to a definite rôle in life of humanity. Yet the realization of the world tasks of Russia cannot be left to the arbitrament of the elemental forces of history: there is call to creative effort on the part of the national will and effort . . . . But even if the peoples of the West will in the end be forced to see the unique image of Russia and to acknowledge her mission, is it so clear that we ourselves know what Russia is, and to what she is called? Even for us Russia remains an unsolved mystery—Russia, so contradictory and full of antinomies.

Berdyaev quotes the well-known legend from the dawn of Russian history, which tells how that people sent an invitation to the foreign Varyags to come and administer their territory: "Our land is vast and plentiful," they said, "but there is no order in it." And our Russian essayist continues:

> How characteristic that was of the fatal incapacity and lack of desire on the part of the Russian people to produce order in their land! It is as if the Russian people did not wish a free empire,—did not so much wish freedom in their empire as freedom for empire,

freedom from all care of earthly management. The Russian people does not wish to be a domineering superior; its nature is passive, rather gentle, ready to obey,—more like that of a wife than that of a husband. Passive, receptive in its relation to imperial matters and power—such is the character of the Russian people and of their history. There are no limits to the meek patience of the long suffering Russian people. . . . . Imperial power was always an external, not an internal principle in the mind of the unimperialistic Russian people. It did not grow out of them but came to them from the outside, as a bridegroom comes to his bride. And that is why power frequently produced the impression of something foreign—a sort of German power.

The immediate result of Slavic suffering is pity and sympathy for humanity, a sympathetic trait which makes the Slavic idealism show itself in brotherly love and feeling of concord towards all people regardless of race, creed or social-economical position. The motto of ancient paganism, "First we understand and then we can love" is diametrically opposed to the Slavic watchword expressed so beautifully in the words of Dostoyevsky: "*Love first and then logic.*" Nature asks no questions about our human logic, for she has her own, which we do not understand and do not recognize until it rolls over us, like a wheel. And to those psychologists who are hysterically engaged in finding a statistical *magisterium mundi*, in discovering a measuring scale for human intelligence or character, I may quote the following words of Tolstoy ("Resurrection," Chapter LIX, first book):

One of the first widespread superstitions is that every man has his own special, definite qualities; that a man is kind, cruel, wise, stupid, energetic, apathetic, etc. Men are not like that. We may say of a man that he is more often kind than cruel, oftener wise than stupid, oftener energetic than apathetic, or the reverse; but it would be false to say of one man that he is kind and wise, of another that he is wicked and foolish. And yet we classify mankind in this way. And this is untrue. Men are like rivers: the water is the same in each, and like in all; but every river is narrow here, is more rapid there, here slower, there broader, now clear, now cold, now dull, now warm. It is the same with men. Every man carries in himself the germs of every human quality, and sometimes one manifests itself, sometimes another, and the man often becomes unlike himself, while still remaining the same man. In some people these changes are very rapid.

Toleration of the Slavic race is a real appurtenance of humanity, for we all are full of weakness and errors. The Slavic race does not see any serious reason why we should not mutually pardon each other our follies, for it is the first law of nature. It knows how to suffer, and therefore, it knows how to bear suffering with a high degree of stoicism, and then, it knows how to inflict it with insensibility when occasion arises. For a thousand years the Slavic race has suffered itself to be conquered and ruled. But they preferred this than to commit suicide.

But a greater vice than such a death is a *criminal act*. Socrates said long ago that it is easier to save ourselves from death than from crime. Figures given by moral statisticians and figures for suicides might serve as a measuring-rod for moral suicide. Comparing the figures which refer to the horrible forms of crime in different European countries, we see that the Slavic race is represented by a, comparatively speaking, very small number of crimes. In the number of those who have been convicted for selfishness, the Slavic race excels all other Europeans, for it shows the smallest number of persons convicted for theft. Official reports of 1903 show, too, that Russia has the smallest number of crimes in general (number of convicted per 100,000 souls)—92, in comparison with other countries, such as Switzerland, 211 (1908), Denmark, 258 (1908), England and Wales, 298 (i.e., all crimes known to police, 1908), France,501 (1905); Belgium,715 (1908), Germany, 1240 (1908), Italy,1350 (1905), Holland, 2701 (1908). The number of insane in institutions per 100,000 inhabitants shows that Russia is represented by the smallest figure; 42 (1899), in comparison to others countries, such as France, 178 (1905); Holland, 187 (1908); Switzerland, 231 (1908); Belgium, 234 (1908); United States, 256 (1907); England and Wales, 356 (1908).

With reference to *moral crimes*, and according to Montesquieu, they are worse for a state than a violation of the laws, Russia in Europe shows only 3.7 moral crimes per million, Italy 7.4 and France 21.4.

To conclude. From all of three graphs of the data we can safely derive the conclusion that the moral height of the Slavic race is an eugenic characteristic which is so jealously preserved by all Slavic tribes. Of course to preserve such a moral height is not an easy task. It requires much painstaking work and effort. A race living according to the rule: *It is better to die than fall morally*, has to use much physical energy for its self-preservation. This energy is not measured by the number of palaces, or the length of railroads, or the quantity and quality of battleships and aeroplanes, or by any other material wealth. It is not, moreover, measured even by the intellectual abilities, for the main thing is not so much to think well, but to act accordingly. A Serbian proverb rightly says that there is no religion without good deeds. Such an energy cannot be identified even at the cost of some higher factor, but is exhibited in the form of a collective moral perfection, in the form of moral instinct and a moral behavior.

And to keep awake this high human instinct is the greatest and hardest task of eugenics, a task which cannot be realized without painstaking expenditure of physical and psychophysical powers. It is just as natural a law as

everything else. Nobody will deny that in the struggle with coarse nature we have to expend much physical energy. Physiology and psychology showed us long ago that moral self-preservation demands an expenditure of physical energies, and even more than any hard physical or manual work. An animal uses much energy in order to hear, see and be alert with its other senses. How much energy is needed for care of the national, racial or humanity consciousness! We might, therefore, say with full right, that a higher moral self-preservation of a nation involves a higher and bigger expenditure of physical energy. The study of such a preservation is only in an embryonic scientific stage and might be called metaeugenics.[2]

[2] Compare my two volumes: "Who Are the Slavs?" "A Contribution to Race Psychology," Boston, Badger, 1919, pp. 538–601.

DISTRIBUTION AND INCREASE OF NEGROES IN THE UNITED STATES

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The probable future growth of the Negro population of the United States has long been a favorite topic for speculation and one upon which opinions at different dates and in different sections of this country have differed widely. The meager preliminary results of the census of 1920, now published, and the few registration figures made available by the Federal government, especially since 1915, throw additional light on the question. A brief statement of these results, which is the object of my paper, may be prefaced by a summary of past opinions and of the efforts of the government to furnish in this field a basis of statistical fact.

In De Tocqueville's penetrating and profound study of the Negroes in the South, first published in 1825, the nearest approach to an expression of opinion is that "The Negro race . . . . will not disappear from the New World as long as that world continues to exist" (1:384) and

> The fate of the white population of the Southern States will perhaps be similar to that of the Moors in Spain. After having occupied the land for centuries, it will perhaps be forced to retire to the country whence its ancestors came and to abandon to the Negroes the possession of a territory, which Providence seems to have more peculiarly destined for them, since they can subsist and labor in it more easily than the whites (1:382).

In Tucker's "Progress of the United States in Population and Wealth," the most important American book on statistics, or as he called it, "political arithmetic," published in the first half of the nineteenth century, no definite forecast of the future growth of the Negro population appears, but the author clearly anticipated that Negroes would increase faster than Southern whites.

Dr. J. C. Nott of Mobile, Ala., was one of the few Americans who enjoyed before the war an international reputation in the field of ethnology. In 1851 he wrote: "The (American) slaves double by natural increase every thirty years and this ratio would give us 50,000,000 in little more than a century" (DeBow's Review 10:330). This is all the evidence in the pages of ante bellum writers that has come under my eye (see F. L. Olmsted).

The probable future increase of the Negroes is a subject in which the census figures of total increase and the registration figures of births and deaths constitute the primary sources of information. The subject was discussed in the Census of 1860 as follows:

> With regard to the future increase of the African race in this country various extravagant speculations have been recently promulgated (i.e., shortly before 1864). . . . . The rate of increase will be seen at a glance (i.e., at the table) to have been gradually diminishing especially during the last thirty years. . . . . For the future the rate will probably continue to diminish."

The writer proceeded to estimate the number of Negroes who would be found in the United States at each of the following four censuses. He exaggerated the real numbers, those for 1870 and 1880 by less than 1 per cent, that for 1890 by 6 per cent and that for 1900 by 8 per cent (Eighth Census, Population, p. IX.)

Farther on he adds:

> These developments of the census . . . . indicate with unerring certainty the gradual extinction of that people (the American negroes) the more rapidly as . . . . they become diffused among the dominant race. . . . . It seems therefore quite rational to conclude . . . . that the white race is no more favorable to the progress of the African race in its midst than it has been to the perpetuity of the Indian on its borders and that . . . . the colored population in America wherever . . . . it must . . . . be greatly subordinated to the white race is doomed to comparatively rapid absorption or extinction.

With this official support the theory that the emancipated Negroes were unlikely to hold their own numerically in competition with the whites seems to have rapidly gained ground. It was reinforced by the results of the following census, showing apparently, that between 1860 and 1870 Negroes in the United States increased only two-fifths as fast as whites and in the South only two-thirds as fast, differences between the races quite without parallel in the earlier history of the country or the South.

The results of the census of 1880 revealed a curious and surprising reversal showing, apparently, that in the United States the Negroes had increased much faster and in the South a little faster than the whites. We now know that these anomolous results were due in the main to serious omissions in the census of 1870, especially in the South and among the Negroes, errors which led to an understatement of the real increase between 1860 and 1870 and an overstatement of the real increases between 1870 and 1880. But to establish that fact and then to bring it home to the interested public were far from easy and the latter never completely accomplished. To this day

the opinion that Negroes are outstripping the Southern whites seems to be widely held.

For many years after the close of the Civil War political opinion of both parties in Washington was unfavorable to a study of Negro statistics by the government. This was brought home to me twenty-eight years ago on my first visit to the statistical officer at the Capitol. There I learned that the Commissioner of Labor Carroll D. Wright, who had then held the commissionership under both parties since its establishment eight years earlier, had applied, at the start to his first superior, the Democratic Secretary of the Interior from Mississippi, and four years later to his second superior, a Republican President from Indiana, and was then awaiting an appointment with his third superior, a Democratic President from New York, asking in each case authorization to make a statistical investigation of the condition of Negro labor. That he had failed in the first and second applications I was assured; that he failed also in the third I surmise from the fact that no such report was made. The local studies of Negroes in various cities, which began to appear in the Bulletin of the Department of Labor in 1897, may have been an indirect way of approaching the problem after the larger plan had failed to win authorization.

In connection with the census of 1900 certain population topics were studied intensively in a volume called "Supplementary Analysis." In that volume the section on Negroes was much longer and fuller and aroused more widespread interest than any other. In preparing it the writer had the advice and help of a Southern white man and a Southern Negro as well as of two other government statisticians. The hope expressed in the preface to that pioneer work that it might "lead others to further and more adequate efforts in the same direction" was gratified in 1918, twelve years later, when the volume on "Negro Population 1790–1915" appeared.

In 1917 came from the Census Bureau the first of a series of annual reports on Birth Statistics, which has now been followed by four more and a few weeks ago the preliminary results of the enumeration of racial stocks in the United States in 1920 were given to the public. It is to this recent material and some inferences from it that I wish this afternoon to invite your attention.

The increase of Negro population during almost sixty years of freedom, 1860–1920, can be compared with the preceding sixty years, 1800–1860, when the great majority were slaves. In the earlier or slavery period the Negroes increased by 3,440,000 or 343 per cent; in the later period, after emancipation, they increased by 6,021,000 or 136 per cent. The amount of increase in the later period was nearly double that in the earlier but the rate

of increase in the later period was only about four-tenths of that in the earlier. Much of the differences in rate should be ascribed to the Negroes sharing in the retardation of growth in the later decades observed in nearly all parts of the country. Although white immigrants in the later sixty years outnumbered those between 1800 and 1860 by some 23,000,000, yet the rate of increase of whites of all classes between 1860 and 1920 was less than half as fast as it was between 1800 and 1860. During their period of slavery, however, Negroes increased two-thirds as fast as whites but when both races were free little more than half as fast.

This period of one hundred and twenty years may be divided into six of twenty years each, three of slavery for most Negroes and three of freedom for all. This method skips the inaccurate figures of 1870 and the dubious figures of 1890. The per cents of increase were as follows:

PERIOD	PER CENT INCREASE OF		RATIO OF INCREASE OF NEGROES TO WHITES (= 100)
	Negroes	Whites	
Slavery:			
1800–1820	76.8	82.7	93
1820–1840	62.2	80.5	77
1840–1860	54.6	89.7	61
Freedom:			
1860–1880	48.2	61.2	79
1880–1900	34.2	53.9	64
1900–1920	18.4	41.9	44

Among Negroes the rate of increase decreased regularly and rapidly and in the last twenty years was only one-fourth of what it was in the first twenty while with the whites the rate attained its maximum in the middle of the century and in the last score of years was fully one-half of what it was in the first. The Civil War was mainly a white man's war; the Negro race, in comparison, suffered little and the sharp check of immigration, 1860–1880, also affected mainly the whites. These facts are reflected in the figures. White increase fell 1860-1880 by about one-third of the rate 1840–1860, but Negro increase fell by only one-eighth.

The Census Bureau has tried recently to correct certain early and inaccurate returns of Negroes enumerated and has then compared the rates of increase of the two races. Into their results I have introduced a further correction to allow for the fact that each of the last two census intervals 1900–1910 and 1910–1920 was less than ten years. My figures are as follows:

DECADE	RATE OF DECENNIAL INCREASE OF		NEGRO RATE COMPARED WITH WHITE (= 100)
	Negroes	Whites	
1860–1870	21.4	27.5	78
1870–1880	22.0	26.4	83
1880–1890	17.6	26.7	66
1890–1900	13.8	21.2	65
1900–1910	11.2	22.3	50
1910–1920	6.5	16.0	41

In the decade, 1910–1920, the increase of Negroes was two-fifths of that of the whites. Since 1880 the darker race has been relatively and rapidly losing ground.

In the years immediately following the Civil War a belief that under freedom the Negroes would rapidly distribute themselves over the country was commonly held. At every census before 1870 between 91 and 93 per cent of the Negroes resided in the Southern or slave states. Between 1860 and 1910 this proportion fell only from 93.2 to 89.0 per cent. But between 1910 and 1920 it fell to 85.1 per cent. During that decade the increase in the number of Negroes living in the northern and western states was greater than the increase during the thirty years between 1880 and 1910. As a result of this out-flow the Negro population of the former slave states increased less than two per cent while that of the North increased 43 per cent and of the West 55 per cent. The movement cannot yet be thoroughly studied but what information is available indicates that the migration has gone almost exclusively to the industrial districts of the North and West. Whether it is a temporary dislocation of population due to war time conditions or a persistent drift can not yet be foreseen.

The remarkable fall in the rate of Negro increase and the rapid distribution of Negroes over other parts of the country than the South are the striking changes revealed by the preliminary census figures. How is the fall in the rate of increase to be explained? Has it any connection with the growth of interstate migration? To get light upon these questions we turn from the census figures of living population to the registration figures of births and deaths. Since 1900 the United States had been developing towards a national system of vital statistics by voluntary coöperation between the Federal Government and the governments of the states and cities. For five years, 1915–1919 inclusive, the births and deaths of Negroes in a number of Northern States including the New England States, New York, Pennsylvania, Michigan and Minnesota and for a shorter period the same

facts for several other Northern and a few Southern States are known. The figure for the Northern States areas follows:

Births and deaths of Negroes in Northern States: 1915–1919

STATE	BIRTHS	DEATHS	NATURAL DECREASE	DEATHS TO 100 BIRTHS
New England	8,634	9,101	467	105
New York	19,088	20,342	1,254	106
Pennsylvania	24,924	30,786	5,862	130
Michigan	2,971	3,488	517	117
Minnesota	525	870	345	165
Total	56,142	64,587	8,445	114

In each of these divisions Negro deaths outnumbered Negro births by between 5 and 65 per cent and in consequence the increase of Negroes in all these States has been entirely due to immigration.

In the Southern States the following compilation of all available figures shows results which are widely different:

STATE	YEARS COVERED	BIRTHS	DEATHS	NATURAL INCREASE OR DECREASE	DEATHS TO 100 BIRTHS	WHITE DEATHS TO 100 BIRTHS
Maryland	1916–19	25,418	25,407	11	100	68
District of Columbia	1915–19	11,042	15,280	−2,238	120	81
Virginia	1917–19	57,244	42,971	14,273	74	48
Kentucky	1917–19	12,460	17,410	−4,950	140	51
North Carolina	1917–19	67,724	42,633	25,091	62	41
South Carolina	1919	22,599	14,439	8,160	64	39
Total		196,487	156,140	40,347	79	52

In every one of the Northern States Negro deaths outnumber births; in the Southern States the conditions are reversed but to this rule there are exceptions. Kentucky and the District of Columbia resemble the North rather than the South. Maryland holds a middle position, births equalling deaths and the farther South the State the greater the excess of Negro births over deaths.

The difference between the District of Columbia and the two States adjoining it suggests that an excess of deaths over births may be found in cities whether Northern or Southern rather than in Northern States whether urban or rural.

Births and deaths of Negroes in cities and rural districts of Registration Area: 1915–1919

	BIRTHS	DEATHS	DEATHS TO 100 BIRTHS
Cities	100,203	121,306	121
Rural districts	169,353	122,565	72
Total	269,556	243,871	90

Clearly the difference between city and country is at least as influential upon race increase as the difference between South and North which in this case closely parallels it. Further analysis shows that throughout the North and in the cities of the South Negro deaths are more numerous than Negro births.

	BIRTHS	DEATHS	DEATHS TO 100 BIRTHS
Northern cities	58,921	68,698	116
Northern rural	14,148	19,033	134
Southern cities	41,282	52,608	127
Southern rural	155,205	103,532	66
Total	259,556	243,871	90

These figures show as conclusively as their incompleteness permits that the conditions under which Negroes live in the North are unfavorable to the natural increase of that race and that in this regard no important difference appears between city and country. They show also that Southern cities are even more unfavorable than those in the North to natural increase.

Further light upon the slackening rate of Negro increase is thrown by advance figures of age and sex kindly supplied me by the Bureau of the Census. Between 1910 and 1920 the number of Negro children under five years of age in the United States decreased by nearly 120,000 (119,425) or almost ten per cent and the number of white children increased by more than 1,000,000 (1,051,007) or more than 11 per cent. At every census from 1850 to 1910 inclusive the number of Negro children to 1000 Negro women of child-bearing age, fifteen to forty-four years, exceeded the number of white children to 1000 white women by numbers between 35 and 174 per 1000 women but since 1880 the difference has steadily decreased. In 1920 for the first time the proportion of white children to white women exceeded that of Negro children to Negro women, the difference being 42. For each race the birth rate as thus roughly measured fell but among the Negroes

the fall was 17 per cent, among the whites it was 2.5 per cent. This crude analysis may be continued by confining attention to the figures for the Southern States. In that section the number of Negro children under five years of age decreased between 1910 and 1920 by nearly 150,000 (148,521) or 12.7 per cent and the number of white children increased by 134,000 (134,036) or 4.7 per cent. In the South at every census before 1900 for which the facts are known there were more Negro children to 1000 Negro women than there were white children to 1000 white women, but in 1900 and since, the proportion of white children has been the greater; in 1900 by 14 children per 1000 women, in 1910 by 63 children and in 1920 by 84 children. At the present time the proportion of children to women among Southern Negroes is only about five-sixths of what it is among Southern whites.

These changes will doubtless prove to be closely connected with the rapid urbanization of Negroes between 1910 and 1920. The rural Negro population of the United States decreased in that decade by nearly one-fourth of a million (239,308) or 3.4 per cent while the urban population increased by seven-eighths of a million (874,616) or 32.7 per cent. The proportion of Negro children to women in the urban districts was in 1920 only 72 per cent and in 1920 only 63 per cent as large as the proportion of white children to white women. In the rural districts, on the contrary, the proportion of Negro children in 1910 was 7 per cent greater and in 1920 it was 5 per cent less than the proportion of white children. Under these conditions the swarming of Negroes into cities North and South and the sharp fall in the increase of all American Negroes are related almost as cause and effect.

The great reservoir for the natural increase of Negroes is the country districts of the South in which apparently there are about three births for every two deaths. The sharp check in the growth of Negro population between 1910 and 1920 was due primarily to the flood of migration from the agricultural districts of the South largely to the cities and industrial districts of the North but partly also to the cities of the South and its exposure in its new home to conditions tending to raise the death rate or reduce the birth rate, or both. The white race is not equally burdened. In the cities of the registration area, 1915–1919, there were only 62 deaths of whites for each 100 births, the corresponding figure for Negroes being 118. In this regard the Negroes of the United States are in somewhat the same position as the whites on both sides of the Atlantic a century or more ago when cities were in a sense parasites upon the surrounding country districts at whose expense alone they could grow or even maintain themselves.

In a paper on "The Probable Increase of the Negro Race in the United States" printed in 1905, I expressed the opinion that the maximum limit of the probable Negro population at the end of the twentieth century was 25,000,000 and that it might fall short of that by several millions. This was far below any of the estimates which had then been made by others. In view of the evidence subsequently derived from the census of 1910 and the preliminary results of the census of 1920, showing as they do that tendencies which first became apparent between 1880 and 1900 have continued and are exerting more influence, I am now disposed to modify the earlier conclusion. If the rate of increase between 1900 and 1920 be projected through the rest of the century without change, it would yield at its close about 20,500,000 Negroes. Probably this rate will not be maintained, but will continue to fall, although more slowly than it has since 1880. If so, we might now say that 20,000,000 should be accepted as the maximum limit of the Negro population of the United States at the end of the century, and that the number may fall short of that figure by several millions. It also seems reasonable to anticipate that the Negroes which at the first census were over 19 per cent or nearly one-fifth of the population of the country and now are about one-tenth, are likely by the end of the century to be not more than one-twentieth.

THE PROBLEM OF NEGRO-WHITE INTERMIXTURE AND INTERMARRIAGE

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I can only very briefly touch upon this extremely complex problem. The time which I had hoped to have available for the purpose of an extended consideration will be required in the furtherance of a scientific exploration expedition into tropical diseases of northern South America.

I had occasion to discuss the general aspects of the problem of race intermixture as early as 1896, in my "Race Traits and Tendencies of the American Negro." On that occasion I made use of the hardly permissible term "race amalgamation," for I should have more clearly emphasized that the infusion of white blood into the negro race is all on the male side, and that there is very little of race amalgamation deserving of consideration. As I had occasion to say in 1896, "The race is so hopelessly mixed that it is difficult to arrive at a clear definition, and the term 'colored' will probably serve as well as the awkward phrase, 'persons of African descent.'" The conclusion was advanced at the time that on the basis of such observations as were possible one would seem justified to hold that "the mixed race is physically the inferior of the white and pure black, and as a result of this inferior degree of vital power we meet with a lesser degree of resistance to disease and death among the mixed population, in contrast with the more favorable condition prevailing among the whites and pure blacks." In addition, it was said, "Morally, the mulatto can not be said to be the superior of the pure black. In the absence of comparative statistics it is next to impossible to prove this assertion, based largely on individual observation, which may and may not be accurate. This much, however, is probably true, that most of the illicit intercourse between whites and colored is with mulatto women and more seldom with those of the pure black type. From such instances as have come to my notice, the few white men who have married colored females usually prefer the mulatto, and the same selection no doubt prevails among those who disregard the law of sexual morality."

In the Census report on the negro population, published in 1918, separate consideration is given to the question of "black" and "mulatto" elements,

it being said, that "The classification of the Negro population as 'black' and 'mulatto' does not correspond accurately to any physiological characteristic, although it is a classification which measures with some uncertain degree of accuracy the admixture of white blood in the population classified as Negro. The increase in the proportion of the mulatto in the Negro population may, however, obviously result, and undoubtedly has in the past largely resulted, from the marriage of mulattoes to blacks, as well as from the mixed marriages of Negroes and whites." The actual figures available for the year 1910 indicate that out of a total negro population of 9,827,763, 7,777,077 were returned as pure black. The remainder, 2,050,686, returned as mulattoes, constitutes 20.9 per cent of the total. Compared or contrasted with earlier and similar investigations, there has been a gradual increase in the mulatto element from 11.2 per cent in 1890 to 20.9 per cent, as stated, in 1910. There are, however, significant differences in the proportion of mulattoes to black, when consideration is given to the different geographical sections of the country. The proportion is lowest in the South, or 252 mulattoes to every 1000 blacks, the North holding a medium position with 363, and the West the maximum position, with 473. Smaller actual numbers may possibly have some bearing on these differences, but it is a safe assumption that the tendency towards race intermixture is more pronounced in the West than in the East or the South. This conclusion is emphasized in the extraordinary investigation made by personal inquiry into the mixing of the two races in the cities of St. Paul and Minneapolis. This study, made by a graduate student under the direction of Prof. A. E. Jenks, of the Department of Anthropology of the University of Minnesota, has been placed at my disposal for the present purpose, and I make use of the opportunity to express to Professor Jenks and his assistant my sincere appreciation for the value of the services rendered. The conclusions of this investigation are summed up in the statement that "the white women who have married blacks are of the weaker class, either mentally, morally or physically; while conversely the negro men represent the better class in most respects, at least physically and mentally. It is felt that the women who have so married have married into a much better economic condition of life than they would have had they married among their own race or kind. Most of the women are of foreign birth or parentage, and though they all professed a prejudice in the beginning it certainly could not have been as deeply ingrained in them as among those in which it was inborn or of native stock." Most of the women were working girls who married porters or waiters. The fine physique, the politeness, the sentiment and evident appreciation with regard to his white wife, would seem to

have been the winning virtues. It is realized, however, that this investigation has only just touched the fringe of an important question and that it should be treated exhaustively in much more detail to justify final and definite conclusions. At the present time the writer is unwilling to advance his own views "as to what action should be taken to curb this influx of black blood into the veins of innocent children." The individual cases considered follow:

Case 1. E. E. T., Van Buren Street, Hamline. The first family visited was Mrs. T., known among Hamline "U" Co-eds as the millionaire washer woman. Whether or not Mrs. T. speaks English I did not learn. Her daughter, however, a fairly educated woman of twenty, gave me such information regarding the family affairs and history as I desired.

Mrs. T. was of German birth. She came to the United States with a colony of Germans when a young lady. The Colony settled in Missouri in the vicinity of the Ozark Mountains. Among these people the newly freed slaves of the Southern States found ready employment. Thus it happened that Mr. T. met and wooed Mrs. T., who, ignorant or careless of local prejudice, accepted, and their union has brought into the world at least three children, white in many respects, yet sufficiently marked by negro features as to be known as colored rather than white.

Mr. T's lineage is interesting in that it brings a third race into consideration, viz., the Red, his lineage being somewhat as follows: On his father's side a black grandmother and an Indian grandfather; on his mother's side a colored woman though of probably only one-eighth or one-sixteenth pure, being very light.

The children of this union show the marks of their parentage somewhat peculiarly. The oldest, a daughter, Mrs. B., (also married to a negro) is not darker than the average white with a respectable tan, her hair is straight, and her cheek bones are prominent and high, in these respects showing the red blood. Her eyes, however, are of the negro mellow brown and her lips inclined to be thickened and nose somewhat flattened. These latter, however, are not conspicuous enough to rouse suspicion of her negro lineage to any except a seeker for such evidences. In all events she shows more of the red than the black blood.

The two younger children, little girls probably seven and nine years of age, show decided evidence of their negro parentage. Each has a decided chocolate tinge to her complexion and each has woolly hair. However, the hair, instead of being black, is a sandy red or the color of the mother's. The eyes are negro but the nose and lips Anglo-Saxon.

Mr. T. is a porter as is also Mr. B., the colored husband of the daughter. The two families share the same household. Mrs. T. washes for Hamline Co-eds.

The home is a newly built $5000 two story square frame house. Was built and is owned by the two families and is in keeping with homes of some of the best citizens of Hamline. Among those who live within the same block are a university professor, a Methodist preacher, and a number of business men, most of whom own their own homes. German is spoken entirely within this home. Mrs. T. never goes out. Mrs. B. finds her chief associates among the blacks.

Mrs. B. thinks that the only handicap the black or the white with black marks has is the prejudice of the whites. She thinks that eventually that will be overcome and the races will become one. She says this is coming about much faster than the average observer thinks. She said there were probably 200 such families in the twin cities.

The neighbors have no criticisms whatever to make, saying that the families conduct themselves perfectly honorably and that aside from the children they would not suspect them as being negroes.

Case 2. Th., Charles Street. The Th.'s live in a little one-story cottage somewhat back from the street, in a well kept lawn, which is inclosed by a neat woven wire fence. Mrs. Th. is of Swedish birth. She also said Mr. Th. was Swedish, but one look and the testimony of the neighbors disproved this. However, he is not a dark negro, probably a quarter-blood. Large, well built, and a bright looking fellow, altogether such a fellow, except for negro color and features, as any girl would be proud of, i.e., considered physically. On the other hand, Mrs. Th. is a little woman, near-sighted, very fair, with very little hair, altogether impressing one as being a little oldmaidish. As one fellow put it, he thought she married the "coon" because there was no show of her getting a white man. However that may be, she apparently made a good housewife for him, the house giving evidences of a very painstaking caretaker, and though not elegantly furnished, was neat and cosy. Conspicuous among its furnishings was a well supplied bookcase. Apparently she was happy, for at the second call I made she came to the door skipping and singing like a school girl.

They were married some three or four years ago in St. Paul. They have no children but have a little adopted girl from a family in which the father is white and the mother black. Because the child born to this family was colored the father gave it away and it was adopted by this family. The man and wife are never seen together on the street. The neighborhood is one in which whites predominate, with now and then a black family.

Case 3. S., East 9th Street. Mrs. S. lives with her husband and three children. The home is very unassuming, back from and below the level of the street. This, however, is a rented house and has been occupied by them but two or three months, the family being more or less drifters with respect to homes.

The house has below one large room used as a living room, and a "lean to" kitchen, the gable being used for sleeping purposes. The house was not well equipped, there being few pieces of furniture and these of old style and probably second-hand. Most of the available space about the walls was occupied by another large center table which served as a catchall, a large sideboard, a broken down couch, and a chiffonier. On the floor was a rather worn carpet over which was stretched from the front to the back door a much more worn strip of red ingrain. The room had an unused atmosphere about it. Things did not look dirty but dusty and unused. Probably the most conspicuous feature of the whole was the array of enlarged pictures on the walls, of which there were six or eight relatives of both colors. In contrast to this room a glimpse of the well kept kitchen convinced one that Mrs. S. was no mean housekeeper within the territory bounded by the four walls of the kitchen.

Mrs. S. is Danish by parentage and birth, came to America as a young lady and worked as a domestic until marriage. She still speaks with a Danish accent. She is uneducated and uncultured; however, neither rude nor impolite, though somewhat suspicious. She impresses one as being of that type who, being unresourceful, has been led into grievous experiences, which have taught her to be suspicious rather than antagonistic. Accordingly anything that savored of personal questions brought, instead of direct answers, volleys of questions as why and what for. However, an appeal to sentiment developed much that questions could not.

Mr. S. was, when Mrs. S. married him some fifteen years ago, the proprietor of a shining parlor somewhere in the vicinity of Roberts and 7th Streets. Previous to that he had been

both a depot and Pullman porter. The shining parlor seems to have proved a failure, or to have failed in paying sufficient dividends, for it was sold some three years ago. Since that time he has been a wage-earner, but the nature of his present occupation I could not learn.

There are three children in the family. The oldest is a girl of fourteen, rather small for her age, not very dark, and with hair that is curly, not woolly. Her features, except for the eyes, are not those of the negro. She is in the A 5th and it is the hope and ambition of her parents to have her some day become a doctor. The other two children are about three and four years of age and more brown than the older, and their hair is decidedly woolly, which showed itself in spite of the fact that the mother or older daughter both plastered it down with a goodly supply of vaseline. Mrs. S.'s neighbors are white on one side and black on the other, both being of the most vicious and vilest morally.

Mrs. S. thinks that her children are in no manner handicapped in that they have negro blood. She acknowledges that the negro has to take a back seat as compared with the white, but she thinks that is because the negro has as yet not had sufficient opportunity to show what is in him, and that as soon as he does prove to the world that he is equal to the white the prejudice will be overcome. Her attitude is exemplified in her ambition for her daughter.

Case 4. B., Rice Street. The next family visited was that of Mrs. B., and she having just moved, things were still in a somewhat confused state. However, Mrs. B. invited me in and very fully discussed the negro problem. Notwithstanding the disarranged condition of things it was evident that Mrs. B. was no mean housekeeper, for everything had undergone a thorough cleansing before being placed. The furnishings were good but not extravagant nor expensive, there was not overabundance but sufficient for the family of four.

Mrs. B. is of American parentage, is about forty years old, and is now living with her second husband. Her first husband was white and evidently proved to be uncongenial, for I gathered from her conversation facts enough to convince me that she had been divorced from him. She has lived with Mr. B. for fifteen years, they having been married in 1895 in Kansas City, Mo. At the time of their marriage Mr. B. was a practicing pharmacist in Kansas City. Since coming to St. Paul he has had difficulty in securing employment in that capacity, because of skin color, and is employed in one of the Great Northern Coast trains as barber on one of its observation cars.

Mr. B.'s mother was Ojibwa and negro—that is, her father was Ojibwa and her mother negro. On his father's side he was negro and white, i.e., his father's mother was a negro slave, while the father was unknown. He (the child) was probably one of the illegitimate bastards of that period. I take it that Mr. B. is light and shows little evidence of the negro, and that is chiefly manifested in the hair.

Mr. and Mrs. B. have two children, girls about the ages of twelve and fourteen years. These, I am told, are light, the one having blue eyes and fair, while the other has brown eyes. One would never suspect either as being of negro parentage. (This latter fact was verified by neighbors.) However, Mrs. B. says she has one white child and one negro child, and that her negro child is the brightest.

Mrs. B. said she believed that the negro race would never become the dominant race but she thought they were equal to the whites and only needed a chance to show their equality. And she feels that eventually the races would become one, i.e., the white would absorb the black. She says she knows a large number of supposedly white people who have colored blood in their veins but who, because of the prejudice prevalent, pass as white, denying or ignoring the colored blood.

As for marrying blacks, she said that her experience had taught her that the blacks were better husbands than the whites, saying that they provided just as well and were more indulgent with their wives than the average white, allowing them more privileges, with fewer complaints, especially with regard to spending.

As fathers, she says that they are more ambitious for their children than the white, for she said it was her husband's ambition, not that the children should have the finest clothes but good clothes and food and every opportunity for development possible.

Mrs. B. would not advise her sisters to marry a negro but she would tell them her experience, i.e., she had tried both and found the negro to be the better husband. She said she would not exchange him for any white husband she ever knew.

Case 5. R., Rice Street. The R.'s live on the second floor. Mrs. R. is of foreign parentage and birth, probably Danish. She speaks good English and discussed the race question in a frank, open, and unbiased way. She was a working girl, probably a scrub girl or chamber maid, and he a waiter when they were married seven years ago. They were married in St. Paul and have lived here ever since.

Her father was a farmer and as long as she remembers she worked every spare moment, with no thought of play or picnics; that type of life which to her typified the white man's family life she contrasted with her own married life, which had been one of comparative ease. Her conclusions as to the average white woman's life were verified, she said, by the experience of her sisters who had married white men.

She said that the negro men were more indulgent with their wives than the whites as she knows them. They pet and caress their wives more and they are more appreciative of the little thankless jobs which the wife likes to do for her husband. She said they were less fretful and had less of the "tight wad" bearing toward their wives' spending. She said they would allow their wives privileges that the white man would not tolerate. Asked if they looked up to their white wives she said no, decidedly not, for he feels that the head of the household is his possession and considers himself in that respect as good as the next one.

Mr. and Mrs. R. have no children. Asked if she were not somewhat ostracised because of her marriage with the negro, she said yes, by the whites, but not so much by the negroes, although she said that she seldom neighbored with her negro neighbors. She said that it was not necessary for her to be on specially good or friendly terms with either race, for the families of the twin cities in which the husbands were black and the wives were white, had a club of their own, the purpose of which was to overcome social inconveniences which their marital relations might have brought upon them. This club is known as the "Mannassas Club," and has about 200 members in the twin cities, its only rule for eligibility being that the negro seeking admission have a white wife. Each city formerly had an organization but recently the prime mover of the St. Paul organization had died and the club has somewhat disbanded. However, they keep in touch with the Minneapolis organization and from time to time join with them in their dances and card parties.

Members of the club paid a monthly assessment of one dollar, which was devoted entirely to defraying the expenses of hall hire and incidentals which were incident to their periodic association for social dances and card parties, etc. Even among those who belong to this organization race prejudice frequently manifests itself. She says there has always been a division of opinion among its members as to the admission of black women to these social functions. Some were favorable to the admission of these, while others objected, until finally the limits were fixed definitely to only such as were black men with white wives.

She said further that some white wives of black men refused to associate with black women and that they would refuse to associate with one of their white sisters who did.

According to Mrs. R., all black men do not desire white wives or even wives with white blood. And as far as whiteness being a mark of beauty among the blacks, she says that is false, for many black girls use a solution to make their skin more shiny if not blacker. On the other hand, many black men will not have a black wife. The reasons given, she said, were various in both cases, all the way from neatness of dress to economy, etc.

Personally, Mrs. R. says she feels that she could not be happier with a white man. She was neat and clean and, as far as I could see, the house was neatly kept. Later I saw her on the street, and in spite of a necessarily hasty toilet she made an appearance that might well cause many of her white neighbors to envy her her street costume.

Case 6. Mrs. Bal. who lives on Robert Street. She is the widow of three negro husbands and the intended bride of a fourth. Because of the ardent suit of this latter the desired information could not be obtained on three successive occasions. This fellow, a brawny big black fellow, was at the house. I consider Mrs. Bal. wins cases from the fact that Mr. Bal. was the prime mover of the "Mannassas Club;" and felt that if an audience could be secured with her alone that much valuable information might be secured.

Case 7. Mrs. D. Although this case was not investigated it is known so well, and has such important features, I feel that it should be added to the report. Two years ago Mrs. D. lived in a back alley at the rear of a house on Robert street. Her neighbors were all colored except Mrs. Bal. (see above). However, Mrs. Bal. never associated with those in the alley for they were of the lowest type of the negroes of St. Paul. On warm days the men and women would gather around a pail of beer and drink until they could either drink no more or had no money to buy more, then they would lie around in the alley or indulge in drunken brawls, while those who were sober enough, women and men, would go to find work in order to buy more beer. Certainly a black spot on St. Paul's map.

Among these Mrs. D. lived with a rather dark colored fellow and his two little children. But while her neighbors drank and caroused Mrs. Davis washed and ironed almost incessantly. Mr. D. was seldom at home in the day time so he too missed and shunned the beer parties. However, it was evident that he had little respect for himself or his family in that he tolerated living around such conditions.

In talking with Mrs. D. one could not but be attracted by her modesty and seeming refinement. Never boisterous or loud and always busy, neat and clean, and clean both about her house and person. However, she had a sensitive nature and especially with regard to family and husband matters which suggested at once that she was not proud of her position in life. A birthmark which covered nearly two-thirds of her face probably lent its influence toward creating this sensitive nature. The marvel was, why she, a woman of seeming refinement, should be living among such low type of negroes, to say nothing of her having a negro for a husband. The problem is not yet solved. But I am safe in concluding, I think, that the type of life was nauseating, although the negro husband was tolerable; and recent investigation has revealed the fact that she has been divorced from Mr. D. and is now living with another husband in fairly comfortable circumstances in Minneapolis.

Case 8. W. Personally I got no information from this couple. Mr. W. works in the mail room of the Great Northern and until recently lived in West 10th street, but has recently moved and his present address could not be obtained. However, Mrs. W.

confided some things to her newsboy, who is a young man of about twenty years and probably reliable, some things that may be of value in coming to our conclusions.

The newsboy says that Mrs. W. dressed elegantly and had a beautifully furnished home. Not only that but was a beautiful and attractive woman. Because of her attractiveness and beauty this young man said he always marveled or wondered why she had a colored husband. And one day he asked her, and her answer was in substance: That she liked good clothes, good living, and didn't care to be tied down to one man. Her colored husband furnished her a good home and was kind to her; further, he tolerated loose life on her part, which no self-respecting white man would do. Hence she figured that she was insured against starvation and at the same time enjoyed the company, not alone of one white man but of many, all of whom showed her a good time in her interpretation of the word.

In my own collection of cases, published in 1896, I presented much similar material and arrived at practically the same conclusions. At that time I was able to secure some statistics of mixed marriages for Boston, etc., which are no longer collected. There seems to be a positive reluctance to give publicity to the facts, which are therefore largely a matter of hearsay or chance information. The cases cited are suggestive illustrations of a serious danger to the community, which increases the peril of innocent race intermixture, which at any time may reveal traits showing a reversion to primitive types. I had occasion to say in 1896 that, "On the strength of the foregoing facts and observations, the conclusions would seem warranted that the crossing of the negro race with the white has been detrimental to its true progress, and has contributed more than anything else to the excessive and increasing rate of mortality from the most fatal diseases, as well as to its consequent inferior social efficiency and diminishing power as a force in American national life." A prediction made as early as 1827 in the *Edinburg Review* read: ". . . . when the laws which create a distinction between the races shall be completely abolished, a very few generations will mitigate the prejudices which those laws have created and which they still maintain." But the distinctions are fundamental and not legal. The race disparity is as profound today as it ever has been and is ever likely to be. Race intermixture, on the fringe of social decrepitude, is not in the slightest degree an indication towards a tendency which may possibly lead to race fusion. It is forgotten that Wendell Phillips, in 1863, publicly advocated "amalgamation to the fullest extent." There have never been wanting those who have recklessly exploited the sentimental possibilities of race equality. They themselves have never paid the frightful price for stamping race inferiority upon innocent offspring, who face the world not as it might be but as it is. It is appalling to contemplate the harm that is being done by those who give utterance to easy-going views on

the question of race amalgamation. In the evidence which I collected in 1886 case after case was presented similar to those of the University of Minnesota investigation, proving conclusively the truth of a remark by the late Herbert Spencer that, "social relations unfavorable to the raising of offspring in respect either of number or quality must tend to degradation or extinction." It is unfortunate that the negro population for 1920 has not yet been finally announced sufficient in detail. But such information as is available would justify the assurance that the race has practically reached a stationary condition and that it is never likely to exceed eleven, or at most twelve, millions, while the proportion of the negro in the total population will continuously tend to diminish.

It may be argued, of course, and with some force, that the foregoing cases prove that the offspring of illicit sexual relations may ultimately be lost in the white population, but there is no question of doubt that practically all white mulattoes marrying white persons have offspring distinguished with difficulty from the pure white population. It is regrettable that in so important a population center as St. Paul, Minn., no record should be kept of colored or white applications for marriage licenses and that the race factor should be ignored. The suggestion can not be over-emphasized that it is the duty of the State to conserve the institution of marriage and to leave nothing undone to ascertain, if only for eugenic reasons, the underlying racial origins of the contracting parties. In the Minnesota investigation occurs the following observation regarding the local viewpoint of the whites: "Few or none of the whites have any patience whatever with the mixing of the races. Most people are ignorant of the actual number so married and express horror that it could have reached such proportions without efforts being made to check a wrongful practice." As regards the blacks, it is said: "Most of the blacks assume an attitude of indifference or of tolerance. The most earnest objection is raised by the black women, whose chief objection is that such marriages deprive a black girl of the opportunity of marrying a worthy black man." The account continues with five additional individual cases, without, however, the necessary details.

The methods of the investigation are briefly described as follows: At first the investigation was started with an ethnic census blank as the means of approach. It was soon found, however, that every case reached in this manner denied, or gave a false report as to, the racial antecedents of the husband when he was colored. Direct approach yielded little more information, for most of the women felt that the investigator was not authorized to inquire into the facts. The most useful means finally adopted was to make the approach a negro question and keep the women on the defen-

sive, using from time to time personal questions suggestive of a plan for defending unlike racial unions. By this means a considerable amount of unwilling testimony was secured. One of the investigators made a report in connection with this matter as follows:

> I found it difficult to disguise myself, in the first place, while in the second, some of the negro men of whom I made inquiry became too friendly and insisted upon inviting me to keep company. Some of the men confidentially told me of the difficulty of the struggle, and pathetically described the situation. Others were more optimistic and expressed a touch of pride, and animosity regarding the white man.

Reference is made to a so-called "Manassah Society," consisting entirely of colored persons who have intermarried or intermixed with whites, and of whom it is said that "the white women associated with this society do not constitute a social loss to the white population for they are a worthless and degraded set of human beings;" but most deplorable is the fact that "some of them have been led into it through ignorance while young women, or else driven into it through sheer economic circumstances," for which the parents must be responsible. The investigator visited the dance hall and saw a few white women who danced with negroes, but there were no white men. These white women, by their appearance as well as by their conduct, had every indication of being social wrecks.

Another investigator wrote:

> Negro women do not favor unions of negro-whites for two reasons: (1) They believe a white woman would not marry a negro if a white man would marry her, and (2) it leaves their own daughters without negro husbands. One white woman expressed her views to the effect that she married a negro because she believed there should be amalgamation in the United States. She has been unhappy ever since, for she finds herself ostracised by both white and negro women. Another white woman married a negro and wears a veil when on the street or at the theatre with her colored children, because, she says, "white people will misjudge my morals and negro women will shun me if they see me with 'my coon kids.' "

A questionnaire was used by three of the investigators, but it would hardly serve a useful purpose to enumerate the results further than as follows: Generally, it is said, there are no children, the marriage having been contracted primarily for economic reasons. The viewpoint as regards the future of the American negro is set forth in one reply as follows: "When the public in time recognizes the intelligence of the negro man and of the white woman he marries, there will be less prejudice against mixed marriages. The Negro will more and more gain recognition socially and politically as he acquires wealth." As regards the white women who marry negroes, in this Minnesota investigation it is said that, "They are mostly Swedish or German,

or otherwise foreign-born. There are a few Irish and English, the latter representing marriages contracted in Canada. Some of the women had married as early as seventeen or eighteen years of age, being country-bred girls drifting to the city and becoming either prostitutes or social outcasts otherwise. The average number of children will not exceed two to a family." The main cause of intermixture is said to have been "constant or frequent contact with negroes in a shop or other place of employment where girls work and where one or more negroes are employed as janitors. In this way a negro induces a girl by and by to take a personal liking to himself; particularly is this the case on the part of foreign-born girls. In the case of prostitutes and widows, or "hopeless oldmaids," the negroes meet them at negro public dances which such white women attend. With the latter class of women hopeless economic perplexities and destitution drive them to negro husbands; while with the former class, it is both economic condition and ignorance, together with psychological effect of tactful and perseverant inducements held out by the negro.

The foregoing observations are profoundly suggestive of the menace of forcing young white women into departments, particularly in Washington, D. C., where negroes are given positions of authority. In its final analysis, under any condition familiarity breeds contempt as well as easy acquiescence. A white girl whose status is lowered by taking orders from a negro superior must, in course of time, learn to look up to her employer or superior officer, and thus more readily yield to insinuations or proposals, particularly if his economic status is satisfactory. The social position of white women who marry negroes is almost invariably one of social ostracism. In the words of one observer in the Minnesota investigation, "She is severed from all social intercourse with her white neighbors; she does not go out in public with her negro husband; she would not recommend her sisters or others to marry negro men, obviously on the ground that such mixed marriages bring social unhappiness and dissatisfaction." At the same time, many of these women are satisfied for economic reasons if the support is guaranteed, and as a rule negroes make good husbands, being rather proud of their white wives however morally unworthy they may be. It is said in this connection, however, that "the white woman married to a negro is ashamed of her marriage and does not wish to have the public become aware of it, although she claims to be personally satisfied. Her chief regret is that her children will be ostracised as negroes, but this does not conflict with her maternal attachment for them." At the same time it is said, "The home of such people is at best only equal to the average home of an employed white laborer. The general appearance of the interior of such

houses as I visited failed to reflect culture and aesthetic taste, due largely, no doubt, to an inferior income."

The condition of the children is usually deplorable. While in early childhood they frequently mix with white children on equal terms, they are soon realized to be negroes and ostracised as they reach the age of early maturity. Such girls as a rule marry only negroes, while the male children, like their father, may wish to marry white women, if they have the chance.

The status of mixed offspring as well as of the parents is that of social inferiors. The more respectable negro women regret the fact that their men stoop so low in marrying inferior types of white women simply because of difference of color. While some of the negroes may envy their fellows who have white wives, the majority of more self-respecting colored men resent mixed marriages as opposed to the best interests of the race. In general, negroes have a strong aversion to mixed families, and the whites have nothing to do with such families in a social or intimate way. The mixed-blood families live scattered throughout the city, with possibly a small group here or there, but only in such sections as are inhabited by negroes to a more or less extent. Cases are given in some detail but it would not seem necessary to enlarge upon this aspect.

In concluding this interesting study, it is said:

> From personal observation there would seem to be not a single case in which the white wife of a negro is truly happy over her marriage. In such cases as were investigated there invariably have been unfavorable circumstances which forced the white woman or girl to accept the approaches and attentions of the negro. Outside of the innocent and ignorant foreign-born and country-bred girls none of these women are to be pitied, for, leaving out the exceptions referred to, the majority are social degenerates or moral outcasts. There is not a self-respecting white woman or girl who would marry a negro of the class visited or investigated. Those who have done so, from whatever cause, are, in a certain sense, white slaves, who try to make life happy by self-deception. They may possibly be personally satisfied, but when they are barred from the free and open social intercourse with their fellow-beings in general, they are not happy. Most of the men are full-blooded negroes, and almost always found to be ignorant and uncultured. That innocent and ignorant girls fall into such unhappy and unfortunate marriages is largely the result of their economic condition.

The foregoing account conforms to the results of my own investigations during the last thirty years. Broadly speaking, I have never found an intermixed or intermarried white-negro couple where the stamp of social inferiority was not plainly traceable in the result. It would require the most heroic courage to face a life of isolation and social contempt merely because a slight economic advantage is gained by such a union or a certain measure of respectability is secured. It requires to be said, however, that

seldom is complaint made against the negro husband, who, generally speaking, is kind, considerate, and even subservient to his white wife. It is largely on this account, however, that the danger of wrongful race intermixture is such a serious menace. Women are deceived by appearances and by false assurances and a sentimentalism fostered by weakminded advocates of more liberal views of marriage and sex relations. If eugenics has in any single direction an important mission it is as regards the ascertainment of the facts of such unions, which violate what Westermarck has defined as "the law of similarity." Granting that in rather exceptional individual instances the results of such intermixture have not been opposed to social progress, in the large majority of cases unquestionably the mingling of the races leads to racial deterioration and ultimately to racial decay.

I may say in this connection that I do not share the views given expression to by Professor Jenks, that, "Unless the tide turns a very large percentage of our present negroes in time will be incorporated in the then American breed of men." After more than fifty years of emancipation, and in the face of extraordinary social, economic, and intellectual progress, the status of the negro is today as clearly defined as ever. His is a race apart from others and predestined to remain so; but I can not but quote the additional observations of Professor Jenks, who is thoroughly familiar with the results of the foregoing inquiry, that, "Careful investigation of the mental, moral, and physical characteristics of people of negro-white ancestry is certainly urgent." The cases which are known should attract more scientific attention. I conclude these observations with a recent pathetic case of a mixed marriage, which ended in suicide, of a Japanese of good position married to an excellent young white woman, who ended her miserable existence after two months of marital unhappiness. As said in *The New York Journal* of March 26, 1921, in commenting upon this case.

> With a white husband a Japanese woman, except in the rarest cases, could not be happy. Absolute contrasts, products of civilization totally different, can not live happily together. As with Japanese women, so with white women. Each must marry her own kind, or suffer the consequences. The unfortunate young man in this case, innocently, of course, made a mistake, and all sympathy must be with him. But the mistake that he made, as an individual, must not be made by the United States or the people of this country as a nation. It is not criticism of either nation to say that they can not live happily together and can not mix, and it is vitally necessary to have that fact understood.

But the negro is here to stay. He is as much American as any white man. He is of right entitled to his freedom, to his opportunity, and to his pursuit of happiness; but he has no right to claim the exercise of these privileges

at the cost of the white man's civilization or the white man's standard of life. Intermarriages between whites and blacks, just as much as wrongful sexual relations without marriage, are essentially anti-social tendencies and therefore opposed to the teachings of sound eugenics in the light of the best knowledge available to both races at the present time.

THE FIELD OF EUGENIC REFORM

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The section of which this is the opening meeting deals with eugenics in relation to the state, to society and to education; it may be described as the section for applied genetics. I have been tempted to describe it as the section for practical eugenics; but that description would hardly be appropriate. The details of experimentation and research fall outside our sphere; but to make experiments is the most practical thing one can do. Your practical manufacturer knows full well that if he trusted to running forever on the old lines he would soon come to grief. We are, therefore, here dealing with the practical application of knowledge acquired by practical research.

Differences of opinion no doubt exist amongst those who have conducted the researches on which we have to build our practical superstructure; differences both as to methods and as to results. Even more marked differences are, however, sure to be felt in this section, where we have to apply to human conduct the knowledge acquired by others. Ought this to alarm us? I think not. I remember long ago seeing a picture in our English Punch in which a tailor is depicted when making excuses for some misfit as saying, "You must remember, sir, that tailoring has not yet been reduced to the level of one of the exact sciences." My views about eugenics are somewhat similar, though that is not the way I should express them. But we must remember that, as evolutionary science teaches us, uniformity always means stagnation. If we all felt alike, no one of us could ever pick up from a neighbor any wiser thoughts than his own; and we should therefore neither regret a certain amount of divergence of opinion nor attempt to hide it. If the beasts of the field had never fought together in the struggle for existence, mankind would never have been developed out of our apelike ancestors. But do not mistake me. I am not advocating war, which is the most damnable thing on earth both as to its immediate and its racial consequences. We must obtain the benefits which did result from savage warfare in some other way; but competition we must have in everything, our opinions included. If any other eugenist should disagree entirely with my assertions, I shall feel in no way hurt!

But what is the foundation on which we, in this section, have to build? As I have already stated in this room, I hold that our aim as eugenists should be to increase the rate of multiplication of stocks above the average in hereditary qualities and to decrease it amongst the less fit. Others may wish to make our efforts cover a wider field, holding, for example, that the immediate benefits likely to arise from the teaching of sex hygiene should be included. With such as these I shall not quarrel for I am in full sympathy with their aims. But I do think that as a matter of convenience it would be as well to restrict the meaning of "eugenics" so as to make it cover no more than was intended by Sir Francis Galton who coined the word, that is, that it should apply only to measures affecting the inborn qualities of future generations.

Now as to the differences of opinion amongst us, I am glad to think that we are not divided into definitely antagonistic camps; for all are, as it were, linked together by the existence of every intermediate shade of opinion. No doubt at one end of the scale there are eugenists who regard racial progress as an assured law of nature, a progress merely to be hastened by the elimination of certain extremely undesirable types, such as the insane, the feeble-in-mind, and those endowed with grossly defective inborn constitutions. At the other end of the scale are those who regard the signs of the times as pointing without doubt to a slow and progressive deterioration in the innate qualities of all civilized peoples; that is, to national degradation, which it will only be possible to arrest by national efforts covering a wide field of endeavor. In short, though all eugenists aim at improving the inborn qualities of posterity, yet some would attack on a wider front than others. In this connection it may be convenient also to divide inborn qualities into two groups; groups which also can not be separated from each other by any very definite line of demarcation. At one end of the series we have qualities dependent on a single something which the child received before its birth from its parents, whilst qualities at the other end of the series depend on a large number of such somethings; just as we may divide tables into those which have one leg and those which have many supports. In technical language, the distinction here suggested for consideration is that between qualities dependent on a single Mendelian factor—or let us say on one or but few such factors—and qualities dependent on large numbers of factors. The qualities belonging to these two groups demand somewhat different treatment and some eugenists attach more importance to the one group and some to the other.

Let us first consider the single factor qualities—the one-legged tables—in cases where such qualities are harmful; and let us take as a single example

a deformity called brachydactyly, the symptoms of which are the fingers being excessively short. Now a child before its birth either has or has not been endowed with the factor resulting in this ailment. If it has not, it will not show these symptoms, and there is an end of the matter. If it has been so endowed, it is certain to have its hands crippled in this way, and it is, moreover, certain to pass on this deformity to many of its offspring. How the factor first arose in the ancestry of the brachydactylous child is unknown; but its apparently spontaneous appearance is at all events such a rare event that for practical purposes it may be neglected. This is the very simplest eugenic problem with which we have to deal; for if we could prevent parenthood in the case of all brachydactylous persons, we might thus stamp out this ailment forever. The matter is not often quite as simple as this; for, in regard to many defects, the child must receive the harmful endowment from *both* parents in order to be harmed thereby. If the endowment be received from one parent only, its recipient is apparently normal; but all the same he is the carrier of this hidden evil, very likely to be passed on to future generations, and to show its harmful effects when it chances to be combined in one individual with a similar endowment from another line of descent. Here also all that can be done is to prohibit parenthood in the case of all those who, by exhibiting the symptoms in question, show that they have the double dose of defective heredity; though here the beneficial effects will be more slowly obtained. In both cases all that has to be decided is whether the defect in the present and in all future generations constitutes an injury sufficiently grave to justify, *in this one generation only*, the actual prevention of parenthood or the self-sacrifice needed for its voluntary abandonment. The world could be freed from all such ailments more or less quickly, and it is only a question in each case whether it is worth the cost of thus freeing it. But please note—and this is the point to which I especially wish to call your attention—if we were to rid the world of any one of these single-factor hereditary effects we should probably thus benefit mankind in no other respect.

Here I cannot refrain from saying a few words about the feeble-in-mind; though to do so is in a measure to depart from the thread of my argument. Whatever may be the final verdict of science as to the nature of the factors on which this grave evil depends, all experts now agree that it should be treated in the way in which single factor qualities should be dealt with; that is to say, each case should be studied separately and dealt with on its individual merits. Here in the United States you have at least three hundred thousand or four hundred thousand of these unfortunates, and the numbers would probably be far greater if high grade cases were to be included. A

very large proportion of the mental defectives who become parents will pass on this ailment to many of their children; whilst many of their offspring, though apparently normal themselves, will be endowed with the power of transmitting this to their descendants; and, if the interests of posterity are not to be grossly neglected, no feeble-minded person should be allowed to become a parent. Moreover, those who have studied the problem, all of them, I believe, agree that the right method to adopt is, as a rule, segregation; by which is meant confinement in comfort, the sexes being kept apart. We all hate interfering with liberty; but let it always be remembered that liberty necessitates equality, and that as equality is impossible with the feeble-in-mind, they can under no circumstances ever have true liberty. Segregation is unquestionably the kindest course to adopt in most cases, especially when all the natural protectors of the afflicted have disappeared. The creation of the necessary accommodations would present difficulties, but it would be a national economy in the long run.

There is, however, one difficulty to be faced which some eugenists have passed over too lightly. The feeble-in-mind often attract to themselves far more affection than would be expected by the inexperienced, and in nearly all cases the mother has strong instinctive sentiments in regard to her children. The removal of the mentally defective infant from its home is in consequence often keenly resented; a resentment which may no doubt frequently be overcome by argument, except when it is backed up by less reputable desires dependent on the possible economic advantages to the family. Here is a difficulty which must by no means be neglected; though in my country at all events, what is now greatly needed is to make the segregation of the mentally defective more easy, not more difficult, than it is at present. Now these conflicting considerations have forced me to consider what part sterilization could be made to play in the eugenic program. It is not for me to discuss what has been done in this respect in the United States; for there are many present who can deal with this topic better than I can. I am aware that the American Breeders Association has investigated this subject with care, and I wish to urge as strongly as I possibly can that a continuation of these scientific researches is the most practical thing that can now be done. We want to know what is the best method of sterilization, and what are all the objections to it. Is the X-ray method to be relied on? What effect would it have on the offspring if insufficiently applied to produce sterility? Is there any danger of cancer as a result? I strongly press this inquiry with regard to X-rays because I think that the adoption of surgical methods does increase the prejudice against sterilization, especially in regard to the operation needed for women. The prejudice

itself is very likely to be instinctive; for natural selection is almost certain to have eliminated all mental traits which are opposed to procreation. If this be so, this is a prejudice certain to be met with, and only to be overcome by reason.

If a sufficiently safe method of sterilization is available for both sexes as some experts now hold to be actually the case, would it not be a useful auxiliary to segregation? Mentally defective persons ought to be allowed to live at home, or boarded out where they can be useful, provided that ample precautions are taken to make it certain that they can thus be maintained in equal contentment to when living in an institution, that all other conditions are suitable, and that procreation will be very improbable Might not voluntary sterilization be regarded as a strong plea in favor of permission being given by the authorities for the mentally defective person not to be taken to an institution? Many parents would, I believe, gladly welcome this alternative, if carefully explained, in order to retain their child under their own care; though here again it should be ascertained that the home conditions are all suitable. No doubt sterilization may in some cases facilitate immorality; but if the authorities were given power to enforce segregation in the case of all sterilized persons found to be living an immoral life, the harmful consequences might be largely diminished. I am myself inclined to favor the introduction of sterilization as a voluntary and experimental measure; for if it proved to be successful, its use would certainly be extended, its racial advantages being obvious.

To revert to my main theme, we have seen that as regards such bad qualities as are dependent on one or but few Mendelian factors, the right course to adopt is to consider and to deal with each case separately; and this is no doubt the way in which many eugenists wish to treat all such human qualities as need be considered. Probably we shall all agree that the grossly unfit whether they be habitual criminals, utterly incorrigible wastrels, or those endowed with excessively bad natural constitutions, ought not to be allowed to become parents, each individual being separately weighed in the balance. But most of the bad qualities leading to gross unfitness are dependent on many factors, and what I now wish to suggest for your consideration is that the recognition of this fact ought to make us modify in certain respects the policy which we recommend for adoption. To make the point clear it will be better to turn to the consideration of good qualities and to study the methods of increasing the rate of multiplication of those well endowed by nature. No single good qualities known to me can be certainly attributed to the presence of a single factor; and if we consider the make-up of a man of genius, including reasoning power, concen-

tration of mind, energy, perseverance, faculty of observation, et cetera, et cetera, we may feel sure that many factors are involved. Almost every student of eugenics has at some time or other during his career attempted to sketch out schemes for the individual selection of a number of highly endowed persons, for inducing them to marry superior mates, and for the encouragement of the production of large families by these selected couples. Ought we not, therefore, to inquire to what extent reliance is to be placed on such methods when the qualities involved are dependent on many factors? The matter is complicated; but as it is one to which I am very anxious that the attention of eugenists should be directed, I beg for your patience whilst I try to illustrate the point in question.

If a few millionaires were to be selected, and all their wealth were to be distributed broadcast amongst the people, we may be certain that the result would be a feeling of keen disappointment amongst the originators of the plot, for each recipient would receive such a minute share of the booty. Again, if it were possible to create a few millionaires, wealth and all, and if generation after generation, their descendants were to dissipate this newly created wealth until it was widely scattered throughout the whole land, in this case also the ultimate benefits to the mass of the people would be very small. Now the eugenist who wishes to see a number of eminent persons picked out and induced to produce large families is no doubt aiming at what would be equivalent to the creation of a number of distinguished persons in the coming generations; and I do not doubt that at all events as regards the next generation only, a marked success in this respect could thus be reaped. But we have seen that the good qualities of the selected parents would be due to many factors; and these factors, like the money of the spendthrift descendants of our millionaire would tend to become more and more widely scattered amongst the people in accordance with an inevitable law of nature; the final result being, we may be equally certain, very disappointing to the eugenist, as far as ultimate racial results are concerned. If we want more millionaires—I am not saying whether we do or do not—one way to secure their presence in greater numbers in the future would be to raise the level of the wealth of the whole people; for the more we were to enrich the soil of any country, as it were, by increasing its total wealth, the greater would be the number of its inhabitants who would in the ordinary course of trade grow so rich as to become millionaires. In nearly the same way, if we want more persons eminent in morals, intellect, or physical strength to spring into existence in all the generations to come, the most certain method of achieving this result would be to raise the level of the whole people in regard to their inborn qualities. For if this could be done,

the factors needed for the production of a man of genius would exist in greater numbers; their union by chance in any one individual, or the actual appearance of a genius, would occur very often; whilst all the while the mass of the people would be receiving the benefits due to their improved natural endowments. Surely this then is a policy not to be neglected.[1]

The effects of the wide distribution of a millionaire's wealth, even though disappointing to those concerned, yet if accepted as an illustration of the racial consequences of increasing the progeny of a number of selected persons, certainly give a greatly exaggerated idea of the benefits thus to be obtained; and we must seek for some more accurate method of attempting to estimate the probable results. Sir Francis Galton stated that one man in 4000 might be fairly described as being "eminent" in intellect; and we may perhaps in like manner describe the tallest of a group of 4000 men as being eminent in stature. Now Frederick the Great, is said to have picked out the biggest men he could lay hands on, and then to have mated them by no gentle means to very tall women,[2] with the object of securing a number of huge recruits in the coming generation. To what extent the royal aspirations were fulfilled in this respect I do not know. But let us follow Frederick's example in imagination and consider what would be the effect of such a scheme on the average height of the people in future generations. In a town of 8000 inhabitants there would probably be one man and one woman eminent in stature and let us imagine that we bring these two

[1] The analogy of the inheritance of money is, of course, faulty in many respects. With natural inheritance the chances of a person receiving a good endowment from his parents are the same whether he has few brothers and sisters or many. Again, many have no money to leave to their descendants, and often money is only received from one parent. With natural inheritance every one is certain to receive an endowment, good or bad, from each parent, and one endowment is as important as the other. Lastly, whilst we can aim at a more even distribution of wealth, it would be impossible, even if we would, to prevent the fortuitous coming together of the necessary factors so as to produce a man of genius.

[2] Frederick would have produced nearly the same ultimate results on the race if he had allowed his male and female giants to marry whom they liked provided their progeny increased. It has not been sufficiently recognized that, putting aside the effects of assortative mating, the only racial advantages of *mating* the selected individuals are (a) the immediate production of giants, for example, and (b) that greater results can perhaps thus be obtained for the same money, as one stimulus then affects two selected individuals. It should also be noted that if in consequence of their selection the selected persons were moved out of a more fertile into a less fertile stratum of society, and if their descendants remained in that less fertile stratum, then the ultimate results would be dysgenic, whatever might be the more immediate consequences. In these circumstances thus to create an improved type in perpetuity would necessitate the establishment of a rigid caste system.

together, with the result that two more children are brought into the world than would be the case if we had not interfered. Looking to the male part of the population only—for simplicity and not out of disrespect to the female half—we should find that our tall man was rather under 9 inches in height above the average; and, as a rough approximation to the truth, we may imagine that after many generations a certain proportion of these 9 inches, about two thirds, in fact would become evenly distributed amongst the whole male population of the town; or, in other words, that we should thus have raised the average stature of that town by a little more than one six-hundredth part of an inch.[3] If this be a true conclusion, as I believe it to be, you may judge that if you were to pick out the 12,500 tallest men and 12,500 tallest women in each generation in the United States, if you were to mate them together and if somehow or other you were to induce each couple to have two *additional* children, you would thus in about 18,000 years raise the average height of your citizens by 1 inch! In passing I can not help expressing my pity for any official in charge of a department of state dealing with any such duties! But what I really wish you here to note is that mental qualities though not as easily measured as physical characteristics, are distributed in accordance with the same laws and are no more easily improved by dealing with selected groups. Does not this way of regarding the matter throw serious doubts on the ultimate advantages of eugenic reform of this kind; that is, of picking out a comparatively small number of selected persons on account of qualities dependent on many factors. Our main endeavor ought to be to raise the level of the whole people in regard to their inborn qualities, for which purpose large numbers must be affected; and I am inclined to believe that the success of our efforts to promote racial progress will depend largely on this fact being fully recognized by eugenic reformers.

Since we are getting on well enough as we are, why not let things alone? Before adopting the hopeful attitude indicated by this inquiry we ought carefully to consider whether at the present time civilized nations are advancing or deteriorating in regard to their inborn qualities; a most difficult question to answer decisively. Here we enter the region where keen feelings are likely to be aroused; and to avoid the distorting effect of prejudice, let us look to the future rather than to the present. Now these young men of today who are endowed with good natural abilities and

[3] The increase in stature would in truth be materially less than 0.002 of an inch; for regression due to dominance and other circumstances has to be taken into account. See "Correlation between Relatives," R. A. Fisher, *Trans. Royal Soc. Edin.*, Vol. III, Part 2 (No. 15).

constitutions will be nearly all certain in time to earn for themselves a fairly good livelihood, whilst the reverse will be the case with those ill-endowed by nature. Then again, those who are members of small families will receive greater advantages in education and in many other respects than will the members of big families and they will in consequence more easily win their way to the front. These two selective processes will be more effective as civilization advances; and as a result we may expect to find in the future in the ranks of the well to do a most harmful combination of qualities more and more often appearing; that is to say, superior inborn qualities more and more often combined with all those natural tendencies which tend to favor the production of small families; these latter including natural infertility and an innate desire to consider the welfare of children as yet unborn. The result to be anticipated is that, in comparison with the ill-endowed, the naturally well-endowed will as time goes on take a smaller and smaller part in the production of the coming generations, with a tendency to progressive racial deterioration as an inevitable consequence.[4] And if we ask whether known facts confirm or refute this dismal forecast, what do we find? Statistical inquiries at all events prove conclusively that, where good incomes are being won, there the families are on the average very small. Moreover, history teaches us that in the remote past ancient civilizations, after rising to a climax, often began to sink and sink until they disappeared off the face of the earth. These problems are too complex now to be discussed at length; and I can only assert that I can find no facts which refute the theoretical conclusion that the inborn qualities of civilized communities are deteriorating, a process which must inevitably lead in time to an all round downward movement. I am, of course, regarding this question broadly and generally, but I can not refrain from adding that the United States has a mighty future before it, on which the civilization of the whole world may in a large measure depend. It is, therefore, doubly incumbent on its citizens to consider whether their best or their

[4] The theoretical side of all these questions is here quite inadequately discussed. Many authorities have pointed out the effect of wealth in reducing fertility, a subject not here dealt with, though I have been convinced it is a most important factor. As to the possible influence of physiological infertility, see "Human Fertility" by J. A. Cobb, *Eugenics Review*, January 1913. As to the effect of mental traits on fertility and racial progress, see "Some Hopes of a Eugenist" by R. A. Fisher, *Eugenics Review*, January 1914. These topics have been discussed by me at greater length in "The Need for Widespread Eugenic Reform," *Eugenics Review*, October 1918; "Eugenics in Relation to Economics and Statistics," *Journal of Royal Statistical Society*, January 1919; "Some Birth Rate Problems," *Eugenics Review*, October 1920 and January 1921. See also "The Habitual Criminal," *Eugenics Review*, October 1914.

worst stocks are now multiplying most rapidly. If it is the worst stocks, and if no steps are taken to remedy the evil, then this country may in consequence miss an opportunity of filling a most glorious page in future history.

If in all civilized countries the forces the existence of which I have but too briefly indicated, are producing deteriorating influences by acting on the masses of the people, then the only way to counteract this tendency is to set in operation other forces which will affect large numbers in the opposite direction. But how is this to be accomplished? As to good qualities, what I hold to be the main remedy can be expressed in so few words that its great importance is likely to be overlooked. What is necessary is to make it widely and deeply felt that it is both immoral and unpatriotic for couples sound in mind and body to unduly limit the size of their families. No doubt difficulties will be experienced in deciding to what extent the duty of parenthood is imposed in individual cases; difficulties which I have no time to discuss. The main difficulty will, however, be to get this duty strongly felt by the mass of the people; for success in this endeavor would, I am convinced, have a much greater effect on the size of families than common sense alone would indicate. Failure is, however, certain if the problem is not attacked with religious zeal. There ought to be a great moral campaign against the selfish regard for personal comfort and social advancement, for these aims must in a measure be sacrificed on the altar of family life if racial progress is to be insured. We must all learn that if envy and jealousy could be banished, the happiness of our children would depend greatly on their inborn qualities and but little on their place in society. We should recognize that we shall best serve our country by bringing healthy and intelligent children into the world, provided that we can give them a sound education and a fair chance of winning a good livelihood; and all of us should be ready to make some sacrifice of social position in order to obey our country's call in this respect. The nation that wins in this moral campaign will have gone half way toward gaining an all round racial victory.

There are no doubt many economic methods of increasing the rate of multiplication of the people; methods which would be beneficial if applied to good stocks and harmful in the case of inferior types. The main reason why persons of high character limit the size of their families is in order to insure that all the children they do bring into the world shall have a good start in life. Obviously the simplest way to remove this check on fertility is for the state to step in and ease the financial strain on parents due to the upbringing of their children. This method must, however, never be applied

indiscriminately or without consideration, for the qualities of the types affected must ever be held in view; and this is especially to be noted in connection with all schemes for motherhood endowment. Then again an increase of taxation is equivalent to an increase in the poverty or a decrease in the wealth of the persons taxed; and such a change in their prospects will tend to make all couples still further limit the size of their families; unless indeed they are naturally incapable of taking thought for the morrow.[5] It follows that to increase the taxation on the more fit in order to ease the strain of family life amongst the less fit would do a double dose of harm; that is by decreasing the output of children where it should be increased and by increasing it where it should be diminished. There are no doubt evils which can not altogether be avoided; for we are bound to pay attention to the needs of all who suffer, whatever may be their natural qualities. If only looking to the types whose multiplication we want to promote, what we can safely do is to increase the taxation on the unmarried and the childless and, out of the proceeds, to give advantages to the parents of growing families *in the same social stratum*. In regard to all proposals such as that recently made in Australia, for directly or indirectly taking from all workmen a portion of their earnings and for distributing the money thus obtained amongst parents in proportion to the number of their young children, here again the racial effects will be good if, and only if, the benefits received by each couple are proportionate to the contributions made by members of the same group to which they belong, a condition almost certain to be neglected. The economic principles, which I have all too hastily alluded to, involve many puzzling questions in regard to their application; but to neglect them altogether is to court a great racial danger.

Turning to the consideration of influences which would tend to diminish the rate of multiplication of inferior types, we see that the grossly unfit can be separated from the normal population with but little doubt, and that they are often a serious nuisance to society. As regards most of these types it is probable that several Mendelian factors are involved; but even if that be so it is not improbable that some one of the resulting bad qualities may be due to a single factor. For all these reasons it seems right that the grossly unfit should be selected individually from the rest of the population, and that in their case parenthood should be prevented by segregation, with voluntary sterilization as an experimental auxiliary. But here also some attention should be paid to the principle which I am advocating, namely, that with qualities dependent on many factors it is as a rule best to aim at

[5] It should be noted that I am speaking of an *increase* of taxation and not of high taxation. The ultimate racial effects of high taxation are difficult to foretell.

dealing with large numbers rather than with the extreme cases. Taking the criminal population as a single example, it is found that those who have been frequently in prison are practically certain to revert to crime when liberated. These habitual criminals form the bulk of the prison population; they have no good qualities to recommend them; they are too stupid to avoid detection and the only courage which they show is that needed to face disgrace and imprisonment. Merely to reduce the fertility of large numbers of this class would be more beneficial from the racial point of view than to absolutely prohibit parenthood in the case of a small number of persons convicted of grave crimes; persons who at all events are often intelligent and courageous. With the habitual criminal the length of detention should be increased and its severity diminished after each conviction; periods of liberty should be given until it is quite certain that no cure can be effected; and in the end the malefactor should be regarded as a person to be permanently detained because he is incapable of self management, all idea of punishment being abandoned. The benefits thus to be derived are indicated by the statistically proved facts that lengthy imprisonment does lessen the number of progeny of the criminal, and that his children are at least ten times more likely to be sent to prison than are the children of honest parents. Even those who do not believe in heredity may, therefore, be inclined to hold that permanent segregation is justifiable after many convictions. We should endeavor to deal in the same way with the wastrel, the drunkard, and the work shy; that is, as members of large classes the size of which ought to be diminished rather than as individuals requiring separate consideration.

If it be true, as I hold, that there are hidden forces continually at work tending to relatively increase the rate of multiplication of large numbers of those who are below the average in the various qualities held to be desirable, then efforts to deal with the obviously unfit would not alone stem this tendency toward racial deterioration. To prevent our civilization from slowly sinking in the future, some far more widespread action is needed. But how are we, it may be well to ask, to pick out large numbers of the population whose hereditary influence on posterity will tend to drag down the average?[6] Now we shall all probably agree that the fewer young men there are in any country, who prove themselves to be incapable of winning sufficient wages to maintain a family in decency, the better it will be for the community as a whole. This is true even if we only look to the comfort and well being of the children destined to be born in these ill-found homes. Here we are of course tempted to urge that the state should step in and see

[6] It must be remembered that this must be true of half the population.

to it that no disadvantages are felt by the little unfortunates likely to be brought up in bad surroundings for which they would be in no way responsible. Any such action would, however, increase the birth rate of the class affected. Now bad surroundings doubtless tend to increase the number of social failures; a cause of failure which, we may believe, will become less and less operative with every advance in civilization. But a very large proportion of those incapable of supporting a family in decency in normally prosperous times are characterized by certain inborn defects; such as weak constitutions, inferior mental powers, unstable moral qualities, etc., all of which are in a measure to be passed on to posterity. State action of the kind just suggested must therefore be harmful in its racial effects; for we ought to check rather than to increase the size of families born in squalid surroundings. How can this be done? This is a problem to which I most earnestly hope that eugenists will turn their attention; for I confess I have found myself no very satisfactory solution. I can only suggest that state and charitable aid should never be given in such profusion as to prevent the appearance of each child from causing any additional financial strain on the household, for fertility is decreased by financial pressure; but I hardly know what to suggest in the case of those who in spite of this pressure persist in procreation in evil surroundings; and perhaps for the present we should concentrate our attention on the attempt to secure a general approval of the desire to lessen the output of children in such circumstances. But the problems involved must be solved sooner or later, and in attempting to solve them we must remember that every reform does harm as well as good, and that all we can do is to make reasonably certain that the good results will preponderate over the evil. In order to prevent the civilized nations of the world from slowly losing what has been won by long ages of suffering, no doubt sacrifices must be made and some suffering yet endured. But if we have courage to face this problem without flinching; if we fearlessly advocate what we hold to be right, in spite of the unpopularity of the safeguards and remedies we suggest; and if we can in the end secure wide approval of our aims; then I am myself certain that we shall be able to introduce reforms which will secure untold benefits for mankind, in all the long, long ages to come.

In conclusion may I once again indicate the contrast which, I suggest, ought always to be held in view in framing plans for eugenic reform; a contrast which I have painted with such a broad brush that many qualifications have of necessity been omitted and many points but ill-explained. I have endeavored to show that, for the purpose of our discussions, human qualities may be divided into two ill-defined groups, with intermediate types

between them. At the one extreme there are the single factor qualities; in the case of persons possessing bad qualities near this end of the series, they should be individually selected and examined and then each treated accordingly. Here we should be dealing for the most part with pathological cases or with persons who are likely to become a nuisance to society; and the aim of the eugenic reformer would usually be to rid the world of some definite defect. These are the cases which are least in dispute, and where racial benefits can be most rapidly obtained; and for these reasons it is perhaps to these qualities that our attention should first of all be directed. At the other extreme are those characteristics which separate whole classes of a community from each other, and which obviously depend on a great many factors. Here we generally have to look to the class as a whole, and to apply such remedies as do not necessitate the selection of individuals, the aim being to raise the level of the whole people. It is on such qualities as these that the slow improvement or deterioration of our civilization will in the main ultimately depend; and if they be neglected in our schemes of eugenic reform, we shall before very long begin to lapse back again towards barbarism, thus following in the footsteps of many highly cultivated nations in the past. On the other hand, if our biologists face these problems more earnestly in the future than they have in the past, if our politicians pay more attention to the advice of scientific experts than has hitherto been customary, and if the general public will be guided by common sense in regard to heredity, then I hold that we shall have more right to look with confidence to the future than ever has been the case since the dawn of civilization.

REGISTRATION IN RELATION TO EUGENICS

BERNARD MALLET

Late Registrar General for England

I am glad to comply with a request which has been made to me to offer some observations on the bearing of registration and census administration upon eugenic problems. I have, however, some difficulty in doing so, because it can hardly be said that Government vital statistics, as hitherto understood, have been collected and organized with any direct reference to the study of the "agencies under social control which may improve or impair the racial qualities of future generations either physically or mentally"—to adopt a definition which figures as the motto of the *Eugenics Review* of London. Professor W. Bateson, F.R.S., the author of a brilliant Galton lecture in 1921, has indeed told us that the "first essentials for any serious investigation of the biological structure of the community are analytical data as to the distribution of faculty and similar particulars which our present returns to the Registrar General do not aim at supplying," that "to decide from these returns how the birth rate is distributed among the various grades, even among the various ages, of the parents is not readily possible;" and he adds that the "Registrar General's returns might be made to give that information but they do not because, though Governments are manipulating living units, social physiology is no concern of theirs."

I fear there is truth in this indictment, although, as I shall hope to show, a good deal has been done in the past to lay the foundation for eugenic study, and although the last British Census (1911) did make at least one serious statistical contribution to the problems of human fertility. It may be said, moreover, in mitigation of such strictures, that until we know what precise meaning for our purpose should be attached to the word "eugenic," and until some means have been discovered for measuring the changes which may be taking place in the "actual inborn characters" of a population which would give a clearer direction to statistical inquiries, there may be some excuse for what looks too much like culpable neglect. I can only say, as regards the Department with which I was until recently connected, that we were always anxious to meet modern requirements in this direction as

far as our very limited powers enabled us to do so, and that I hope the establishment of the Ministry of Health, with full powers and active interest in the questions which interest us, may in time enable the dreams of greatly increased efficiency in which we indulged—more coördination of agencies and statistical publications affecting public health, better equipment of intelligence branches and the like—to be realized. I cannot but anticipate that the discussions at the forthcoming Congress will throw much light on all these matters—not only as to the objects to be arrived at but also as to the methods adopted by Government and other agencies, more especially in the United States of America.

It may be worth while to glance briefly at the vital statistics published in the United Kingdom in order to see how far they bear directly or indirectly on "eugenics" and how they might be made of greater assistance to such studies. Good ordinary vital statistics of population, birth and death rates, infant and adult mortality, prevalence of specified forms of disease resulting in death, overcrowding shown by housing conditions, and so on, are of course the indispensable prerequisite for all studies directed toward social improvement. They require to be supplemented by the tabulation of all the known facts as to the prevalent diseases which impair health and working capacity without resulting in death—"morbidity" statistics such, e.g., as might be furnished by the administration of the National Health Insurance Acts in the United Kingdom. All these sets of statistics should be systematically related to each other; death rates, and particularly birth rates, with occupation and housing, for instance, for the hygiene of the workshop in modern conditions is no less important than the hygiene of the home. Even economic conditions, as Major Darwin insisted in his valuable address to the Royal Statistical Society in January, 1919, are closely concerned with eugenics. We cannot afford to neglect the effects of the fiscal and social legislation of the present day in encouraging, on the one hand, the multiplication of the least fit elements of our population, and on the other, depressing the level and even endangering the existence of the intellectual middle classes whose fertility is already disproportionately low. Here also, and generally in the differential effect of the possession of "wealth" on the birth rate, are subjects for more careful study, statistical and other, than has yet been given to them.

Much of this work, of course, is already being done with skill and completeness, much also in a piecemeal and spasmodic fashion, while some has hardly been attempted. All of it would fall well within the competence of a properly equipped public department. Before passing, however, to the consideration of suggested reform in registration which would facilitate

progress in the study of eugenics in a broad sense, I should like to draw attention to a section of the Census of 1911 the results of which have been recognized in Great Britain as a genuine contribution to eugenic research, that which dealt with the fertility of the population, and which, by its inclusion of questions as to the duration of marriages and the numbers of children born and surviving, has provided material, on a national scale, for analyzing the fall in fertility since 1876 (the year of the highest birth rate) by social class, occupation, birthplace, and locality of residence. I am proud to have been associated, as the official in charge of that Census, with this novel departure, but the credit both for the initiation and the organization of the work was due to my colleague, Dr. T. H. C. Stevenson, C.B.E., Superintendent of Statistics at that time.

An untoward fate seems to attend the tabulation of fertility statistics, if, as I understand, those collected at the 1900 and 1910 Censuses of the United States still remain unpublished. In our own case, at all events, the tabulation and publication of the results were most unfortunately delayed by the war, and are not even yet fully available. But in April, 1920, Dr. Stevenson anticipated his report and summed up its main conclusions, with much important comment, in an address to the Royal Statistical Society of London on the "Fertility of Various Social Classes in England and Wales from the middle of the Nineteenth Century to 1911." This paper will be familiar to students of the subject, and I need do no more here than touch on one or two main points.

By a standardizing process, which serves both for fertility and child mortality, a means was found of measuring and comparing the fertility experience of any section of the population throughout the whole period represented by a considerable number of marriages still in existence in 1911, i.e., back to the decennium 1851–1860, from which about 50,000 marriages survived at that date. The selection of suitable sections of the population to which to apply the method adopted presented greater difficulties, since the Census makes no record of social position, only recording various facts from which this may be deduced. The test of domestic servants kept was rejected as applying to too small a section, and that of the size of tenement occupied proved disappointing. It was therefore decided to fall back on the gradation by occupation which had been used in tabulating occupational fertility and infant mortality from the births registered in 1911, a classification which was no doubt open to criticism in some points of detail but which at all events secured comparability with the published birth registration results. Eight social classes were thus obtained (see page xli and table 28A of the Registrar General's 74th Annual

Report for 1911, Cd. 6578 of 1913), the first five of which correspond roughly with the social grades of the population beginning with Class I, Upper and Middle Classes, and ending with Class V, occupations including mainly unskilled men, while Classes VI, VII, VIII consisted of textile workers, miners, and agricultural labors respectively, which it seemed desirable to distinguish separately.

Much of Dr. Stevenson's paper is taken up with explanations of the figures given in the tables quoted and with the discussion of such points as the causes of the low rates of fertility in certain classes and occupations, the effect of female occupation upon married fertility and the probability of artificial restraint as the cause of decline; but the salient fact brought out is that, even when allowance is made by the method of standardization for the variation in the age of marriage in the different social classes, fertility is found to increase downwards throughout the social scale. In addition to marrying later in life the more prosperous classes are less fertile when married. The method used measures the effect of the second difference by eliminating that of the first, and by this means demonstrates that even if these classes married as early as the others their fertility would be much lower. The relatively lower fertility of the more successful and prosperous classes is, of course, no new discovery, but it may be claimed that this disquieting fact has now been established by evidence on a wide national basis.

More formidable from the eugenic point of view is the conclusion arrived at that the relative defect in fertility of these classes is largely a new phenomenon, dating from the commencement of the decline in fertility generally. The difference in fertility between social classes is small for marriages contracted before 1861 (so small as to suggest that if the comparison could have been taken back twenty years substantial equality in this respect may have existed in all classes), and it rapidly increases to a maximum for the marriages, for 1891–1896, with a slight subsequent approximation between the classes which may be more apparent than real.

It is much to be regretted that it has not been found possible to repeat the "fertility" questions in the British Census for the present year; but enough has already been done, as the foregoing paragraphs will indicate and as will be realized when Dr. Stevenson's final report appears, to provide an immense amount of material for eugenic research and speculation; and it will not be for want of warning that remedial action, if such is possible and desirable, is not attempted.

I may now turn to the consideration of certain reforms in British registration methods which are desirable from the eugenic point of view.

As long ago as in November, 1916, in my first Presidential address to the Royal Statistical Society on the "Organization of Registration in its Bearing on Vital Statistics," I expressed the opinion that we were nearly at the end of what purely administrative action under our then existing powers in the General Register Office could do in the way of obtaining further information on which statistical research might be based, and gave an account of the particulars in which the records necessary for the improvement and extension of our vital statistics were either "altogether wanting or defective in accuracy." To remedy these defects we required (and still require) two things: (1) power which can only be given, so far as I am aware, by legislation to obtain fuller information by way of "questionnaires" on the occasion of the registration of births and deaths by members of the public, and (2) a very considerable reorganization of the registration service of the country. Under the first head I will do no more than refer to the suggestions made in that address of fertility tables which might be derived from fuller birth registration information. But I may also quote—just as one instance—a paragraph which has a direct bearing on eugenic study. I wrote:

> As a record the present entry is defective in that it either fails to identify completely the person to whom it relates or fails to point directly to the next step in tracing the family history. Thus in the death entry of one of the hundreds of John Smiths, there may be no clue to the marital condition or to any family relationship of the deceased man; and all we can learn from the record is that a certain John Smith, aged fifty-four, a carpenter, died at such a place on such a day of such a disease. If, however, the entry contained statements as to the date and place of his birth, and that he was the husband of Mary Smith, formerly Jones, to whom he was married on such a date, there would be something resembling a complete identification of the deceased man and indications from which the family history could be traced by any interested person. In the same way, the birth entry of John Smith tells us only that he was born at such a place on such a date and that he is the son of John Smith and Mary Smith, formerly Jones, but it gives no clue to the next step backwards in the family history. If, however, the entry contained the date and place of marriage of his parents it would direct us at once to the documentary record of that event.

The first essential, then, is such an amendment of the law as would enable the authorities to obtain many more data from the public and to remedy long standing deficiencies which it would be tedious to enumerate here. Under the second head falls the question of the administrative machinery required which is in the main one of purely local interest; but the suggestion that a system of General or National Registration should be instituted seems to contain possibilities for the eugenist which would justify some reference to it here. Impressed by the success for its special object of the

National Registration Act of 1915, hastily devised though it was as a war measure, I was soon led to consider the possibilities presented by a permanent organization on such lines; and particularly the suggestion that a General Register might be made to subserve the purposes (amongst others) both of Births and Deaths Registration and of Census in a more complete and reliable form, than the present. I therefore put forward this idea in the address alluded to.

The opportunity was allowed to pass, and I do not know when, if ever, the proposal may be revived. But it has received a good deal of consideration since it was first suggested, and was even made the subject of a special inquiry by a Government Committee which examined the question in detail.

The scheme then drawn up involved the maintenance, in various local centers throughout the country, of registers of the local populations. These registers would contain one or more cards or sheets devoted to each individual, and showing his record from its commencement with the entry of his birth, which would furnish evidence both of his age and identity. (There are many John Smiths, but presumably only one born at a certain address on a given date, to parents of recorded names, ages, and occupations, etc.) To this would be added as time went on the chief registrable events of his life—changes of address, occupation (as already registered under the National Unemployment Insurance Act), marriage, the birth of children, etc., most of the information required being already recorded in one official register or another, but without any provision for the association of the whole. Such registers of the population are already in existence in some European countries; and once the machinery is provided for maintaining them in even an elementary form by ascertaining changes of address and providing for the transfer of the records from one local register to another as the movements of the persons concerned require, a skeleton is available which can be clothed with all the information required for various administrative purposes regarding individual citizens. By this means each separate item of information recorded would acquire greatly increased value from its association with the other facts recorded for the same individual. It is generally the association of the facts rather than a record of the facts themselves which is found to be lacking when further statistical information regarding our population is called for, as we have no organized means as yet of collating the numerous items of information independently collected and recorded as a result of the many paternal activities of the modern state. Thus the scheme amounts to the coördination of the numerous official inquiries and registers now made and maintained independently of each other into a single system which would provide a dossier for each

individual containing those particulars regarding him which the state is chiefly concerned to know.

Upon the purely administrative advantages of the scheme, such as the consolidation of numerous registers maintained for various purposes, I need not dwell; but the existence of a General Register of the whole population maintained locally in the several administrative areas would have an important effect from our present point of view, in immensely improving the validity of the existing (or extended) data derived from the Registration of Births, Deaths and Marriages. For the information supplied by the public on the occasion of a birth or death or a marriage, now uncontrolled and therefore productive of errors would be checked and supplemented by the records of the individual or family which would gradually be accumulated in the General Register, and the production of an identification card containing the name, address, occupation, etc., on each occasion of the registration of any one of these events, would ensure a uniformity of statement the absence of which is one of the principal difficulties met with in the preparation, for instance, of occupational birth and death rates. Under the present system a man's occupation may be stated differently on his child's birth certificate, on his own marriage and death certificate, and on his Census schedule, without any change in his occupation having occurred. When the births of 1911 were tabulated according to the parents' occupations, it became evident that the return of occupation in the birth certificates differed seriously from those stated for the same man in the Census of the same year, and this applies equally to occupational mortality statistics. A general registration system would at least ensure that each individual would have the same occupation at any given time for purposes of occupational registration and registration of marriage, parenthood and death.

Another advantage must be described. The registration of births and deaths by itself, however carefully carried out, can yield but very imperfect evidence as to the trend of natality and mortality. In order to provide the information which has been the foundation of our hygienic progress, and which is demanded by students and administrators alike on an ever increasing standard of accuracy and elaboration, the number of these events registered must be related to the size and make-up of the population among which they occur. As authoritative information on the subject is provided only by the decennial Census the requirement has to be met during the ten years succeeding that event by estimates of the probable numbers living in each locality, estimates which in the absence of a count can never be satisfactory. Many illustrations of extreme over- or under-estimates are

brought to light at each Census. The existence of a General Register would at once remove the difficulty which largely vitiates calculations of local birth rates and death rates upon which sanitary progress so largely depends. With its help we should be able to ascertain the population of the local area at any given date, not only in mass, but in full detail of sex, age and marital condition. This information would be of such immense value to our vital statistics that it might be expected to satisfy the often expressed demand for a quinquennial Census. For it would in fact provide us with an elementary Census annually, or as often as might be required, at a mimimum of trouble and expense. Not only, moreover, would the Census under some such scheme as this form a specially careful and elaborate revision of the Register, but the existence of the Register would enormously improve the information contained in the Census. For the facts stated on the Census schedules would no longer as now be the unsupported statements of more or less careless and irresponsible people, but would represent the revision of a pre-existing record by which the statements made for Census purpose would be checked and verified. Further, the facts recorded at the Census would be brought into harmony with those appearing in all the other records which came within the scheme of general registration. Obviously such a system would provide the first requisite of good vital statistics, full and accurate data.

It is time to consider whether such a general registration system, if instituted, might not be utilized for the furtherance of eugenic research in a more direct fashion. Some years ago the late Mr. Walter Hazell propounded before the Royal Statistical Society (see Journal for June, 1914) a plan for recording, from the existing records of births, marriages and deaths at Somerset House, the life history and family connections of every individual by making "life-cards" for every child which would provide a connecting link between various members of a family and even between the several events of an individual life. The idea was to "raise the life records of men to the level already attained for pedigree animals." Various objections were raised in the course of discussion, some of which, such as the supposed hostility of the population to identification cards and other so-called "inquisitorial" arrangements, the experience of National Registration has shown to be largely imaginary, while others might well have proved insuperable in practice if attempted under present administrative conditions. There can be no doubt, however, that if the scheme for General Registration referred to should ever be adopted it could be made to constitute a record of life histories on a much more complete scale than that envisaged by Mr. Hazell. That scheme involved the creation of a simple or skeleton

central index register of the whole population fed from the local registers, for the purpose of maintaining the accuracy of those registers in the matter of removals and the prevention of duplicate entries. But this index could, if desired, be made to serve other useful purposes and among them a complete genealogical record of the whole population. If to the particulars required merely for identification purposes there were added notes of the parentage, marriages, births of children, change of occupation, cause of and age at death, information would be afforded by which not only could the genealogical history of each family in time be traced, but from which some inferences at least could be drawn as to their social status. It is less easy to see how correct inferences could be drawn from any such records as to the physical or mental fitness of the individual or family.

Pedigree stock books are designed for the eugenics of animals, and it is obviously impossible to press the analogy too far in dealing with men and women. It is for statesmen and eugenists to decide what measures can safely and properly be taken to encourage good stocks and deter the multiplication of the unfit; but it is certain that no action can be taken without adequate knowledge, and it is the primary business of the statistician to provide the facts upon which action may be based. It is from this point of view that I have approached the question of general registration, and I cannot help thinking that in some such development as I have outlined there may be considerable possibilities for the furtherance of eugenic science. But even if the admittedly administrative advantages of a scheme of general registration should eventually lead to its adoption, it would require a much more serious interest in eugenic questions than is at present to be found in government circles in my own or other countries to secure the utilization of the Register for the purposes suggested in the foregoing remarks. We were recently told by a British Minister, as Professor Bateson has reminded us, that "in politics, in the affairs with which Governments have to deal, it is not accurate knowledge that matters, it is emotion!" I do not even know how such suggestions as I have been referring to would commend themselves to eugenic students. If, upon consideration, it appeared to them that the facts of "life history" which might be obtained in this way would be useful, if not indeed essential, to the progress of their work, then it would be incumbent on them to do what they could to educate public opinion and bring pressure to bear on the authorities concerned. It is possible that discussion at the Congress may do something to throw light on the merits or demerits of this proposal—at present in a purely academic stage.

SOME EUGENIC ASPECTS OF THE PROBLEM OF POPULATION[1]

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The problem of population is a problem only because the globe on which we live is strictly limited in size. It does not and cannot grow, or increase in size, to any indefinite degree, in the way that every living thing can and does increase in numbers by reproduction. The earth constitutes a universe of strictly limited size.

Now what happens when a living organism capable of indefinite multiplication of its numbers by reproduction finds itself confined to a universe strictly limited in size? This question was put in an experimental way to a small family of fruit-flies of the genus Drosophila, a form now much used in many sorts of experimental inquiries. These minute flies live mainly on yeast which grows upon decaying fruit and other vegetable material. For experimental purposes the yeast is sown upon a semi-solid medium of banana pulp and agar-agar. To these flies in the laboratory a pint milk bottle represents their universe. They cannot get out. The universe is limited strictly in size by the walls of the bottle, which cannot grow or multiply.

So then a series of experiments like this was performed: a pair of flies, one male and one female, were put with a few of their offspring (say ten or twelve) of different ages, into a pint milk bottle, on the bottom of which was a layer of banana-agar, corresponding to the tillable soil of the earth, properly sown with yeast for food. Then the bottle was closed with a cotton stopper which would admit air, but would not allow the flies to pass out. Then this young and conveniently sized universe was put into an incubator and kept at a uniform temperature of 25°C.

Living then went on within it in a manner in many fundamental respects like that of human beings. The original parents had some more children, finally grew old, and died. Their children grew up and had offspring of their own, and so on. Every three days a census was taken of the population which had accrued up to that time.

[1] An abstract only. An extended technical report of the writer's studies of the population problem will soon appear elsewhere, it is expected.

It was found that the growth of the fly population in its limited universe, followed no haphazard course, but instead proceeded along a smooth and regular curve.[2] The characteristics of this curve were: first growth of population was at a slow but ever more rapid rate. At a middle portion of the whole curve the rate of growth of the population per unit of time was most rapid. From that point on the population, while it kept on growing in numbers, did it at an ever decreasing rate. Finally the universe became densely crowded with flies. The greatest possible number was living that the agricultural potentialities, in the way of yeast crop in this particular pint universe, could support. The population had reached the saturation point.

Now what of the growth of human populations? Theoretically and a priori there are so many complex factors involved in the growth of human populations that it would seem hopeless to expect that any single mathematical expression could possibly describe its course. But in science he is lost who lets his inquisitive bent be hampered or curtailed by a priori logic. The Pauline injunction "Try all things" is, or should be, his guiding motto. In accordance with the principle we have examined with much care the known population history, as derived from census figures, of some twenty odd of the leading countries of the world, all indeed that had enough reasonably accurate census data to make any analysis possible.

It appears that the population growth of every country we have tried follows a course which is described with the greatest accuracy and completeness either by the same mathematical equation which served for our experimental Drosophila population, or by a superimposed combination of two or more of these curves (Ireland, Germany and Japan).

It is evident enough that since the same mathematical theory which described the growth in experimental Drosophila populations also describes that of human population, it is in the highest degree probable, having regard to the complete evidence, only mere scraps of which could be presented in a brief paper, that human populations in limited areas grow in essentially the same manner as experimental populations in closed universes. In other words, population growth in respect of its rate appears to be a fundamental biological phenomenon in which insects and men behave in a similar manner.

Having ascertained the mathematical law in accordance with which this phenomenon operates, we are in a position to predict future populations, and shall get an accurate result just so long as the same kind of forces, social,

[2] For a discussion of the mathematical characteristics of this curve cf. Proc. Nat. Acad. Sci., vol. 6, pp. 275–288, 1920.

economic, and the like, operate as have operated in the past. *Of course, if wholly new factors come into operation, the curves will have to be revised to take account of them.*

From a social standpoint the outstanding result of our experimental and statistical study of the population problem is that all human populations are proceeding at a lawful and predictable rate toward a point of complete saturation; where within any defined area of the earth's surface there will be living the maximum number of people that can be supported in life.

Projecting our thought ahead for a moment to that time, *at most a few centuries ahead,* we perceive that the important question will then be: what kind of people are they to be who will then inherit the earth? Here enters the eugenic phase of the problem. Man, in theory at least, has it now completely in his power to determine what kind of people will make up the earth's population of saturation.

In proceeding to the analysis of this phase of our problem let us first examine what man has, in the past, done about the problem of population, either consciously or unconsciously. In general, attempts have been made in two fundamentally different ways to meet the problem of population pressure: viz.,

1. Acquisition of new territory: (a) By conquest, (b) by more or less peaceful penetration.

2. Limitation of reproduction: (a) By operative interference, (b) by segregation, (c) by "birth control."

The eugenic aspects of each of these methods were then discussed, and it was pointed out that from a practical viewpoint none of them offers any great hope of a satisfactory solution of the problem. Birth control offers perhaps the most hopeful outlook but it is beset by many difficulties.

POPULATION IN RELATION TO AGRICULTURE

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The world is not as big as it used to be. It has shrunk tremendously in the past few years, what with 40-knot vessels, 60-mile trains, aeroplanes, wireless and other devourers of distance. It is difficult to realize the change that has taken place in our outlook on many economic problems due to this globe girdling with easy means for commercial transactions and for personal migrations. In this sense the peoples of the earth have formed what may prove to be too close a League of Nations. In the olden days a people raised its own food, manufactured its own utensils, or went without. Today one sits down to breakfast, spreads out a napkin of Irish linen, takes up a banana from Central America, follows it with cereal of Minnesota wheat sweetened with the product of Cuban cane, and ends up with a Montana lamb chop and Brazilian coffee. Earlier, whole tribes, forced out of their native plains by overcrowding, girded their loins and fared westward till they found a fair land to their liking, and took it in spite of any protest on the part of the previous owners. And, as nearly always happened, there was sooner or later a racial intermixture, which, whether good, bad, or indifferent, was as a whole somewhat uniform. Today, migration is by the single family. They go to and fro upon the earth with little hindrance, seeking places to better their personal fortunes with no thought either by their new neighbors or by themselves, as to what will be the ultimate result in the intermarrying that is sure to follow.

It is not my purpose to touch upon the racial side of this great question. I have made these statements because I wished to point out that squatters have already camped on the choice spots of the earth's surface, and those who come after will have to take the byways and hedges and the stony ground. More migration has taken place during the nineteenth century than at any time during the history of the world. There has been no blare of trumpets or flying banners, but people by the millions have flitted out of their native harbors to the uttermost parts of the earth. They have settled these uttermost parts and have increased and multiplied at a greater rate than before the flitting. And why? Largely because the rate of

natural increase in their native land had become so great that there was hardly enough food to go round, and modern means of communication made the flitting easy. There is a lot of nonsense current about the modern migration. We are told that people emigrate because they are politically oppressed. In nine cases out of ten they do nothing of the kind. They emigrate because they are physically oppressed; because they do not get as many of the necessities of life as they think they have coming to them; and the prime necessity is food.

A few facts will make this clear without an extended argument.

The human race has had a long pull of many million years since it first stood up on its hind legs and began to make a bid for world supremacy; it has had a history of at least 10,000 years since it developed enough mentality to leave written records; yet in all this time the natural increase was so slow that in the year of our Lord 1800 there were only some 850 million people. Since that time, a short 100 years, the population has doubled. Ten million years, let us say, to reach a population of 850 million, 10 million and 100 years to reach a population of 1700 million. Some excuse for the present generation saying their forefathers were slow.

The world has had a continuous natural increase annually for the past century of about 0.7 per cent, and the increase at present is greater than at any time during the past. My own estimate of this current annual increase, from a careful study of all available data, is 15 million or 0.9 per cent. In other words there are 2 new Belgiums to feed just now with each additional year, and the number is increasing like a compound interest table. And my own estimate is conservative since Knibbs,[1] perhaps the greatest of our contemporary population statisticians, estimates the current increase at 1.16 per cent, or nearly 20 million a year. By his estimate the world must provide food for a new France at every biennium.

With these figures before us it is not difficult to see why there has been, is, and will be emigration from the older to the newer countries. In 1800 not a single country had reached a point where the population was pressing heavily upon subsistence in present day terms. There was pressure, it is true, but it was because of unstable political conditions, poor facilities for food storage, and lack of a cheap, efficient, rapid means of transportation.

Today the story is different. China is full to overflowing, India and Japan have passed the saturation point according to Western standards of living, but are increasing because they have never had those standards, and each individual accepts the fate of a life-long grind such as we have never

[1] Knibbs, G. H. The problems of population, food supply and migration. Scientia 26: 485–495. 1919.

known, merely to keep hunger from the door. Europe as a whole is over-populated, and I firmly believe this over-population was the main cause of the world war. The Australians living on the rim of a barren desert bowl are increasing at the rate of about 18 per thousand, a rate which their agricultural possibilities cannot stand for long. The population of Canada is increasing still more rapidly. Our own United States have reached the point where there are diminishing returns in crop production. There remains, then, only Africa and South America as colonization centers with a high degree of natural soil fertility, and these continents lie largely in the tropics where the white man cannot thrive. When they are filled, nothing remains but to push into the arctics and the deserts.

Obviously the world is filling rapidly. Fifteen million more seats at Nature's banquet table must be provided yearly. See what this means in terms of land. A careful study of the available statistics shows that by and large it takes about 2.5 acres to support each individual. Some self-supporting nations can make out with less, but only when they put all their efforts into cultivating their richest land; others with less efficient methods take much more. Taking this as the average figure, then, it is necessary to plow, plant, cultivate, or otherwise tend, some 37 million acres more land each year than was ever so treated before, if the nations of the earth are not to go hungry.

It is a curious illustration of the general tendency of people to be optimistic about everything, that even many of our most eminent economists believe this wresting of additional food from the soil is an easy task. They draw wonderful pictures of what science has done in the past few years, make roseate prophecies of similar advances in the future, and keep everyone happy with the idea that the human race has unlimited credit on Nature's bank. Never was logic more fallacious.

A little arithmetic will show us that no matter how great the heights of human genius in providing for future generations the present rate of population increase, a geometrical rate continuously compounded, cannot continue indefinitely. The total land area of the globe, 33,000 million acres, seems large, it is true; but one cannot utilize all this area for raising crops. Take out the mountains, the deserts, the undrainable swamps, in short the areas not available for agriculture, and there is left about 13,000 million acres. Of this potential world farm, some 5000 million acres are now being cared for by the hand of man. According to our previous calculation, then, the maximum population the earth can support is a little over 5000 millions. *And, here is the heart of the matter, the time when this important event would take place, at the present rate of increase, is not so far distant but that some of our grandchildren would live to see it.*

Naturally this present rate of increase, which is greater than that of the past, cannot be maintained in the future. We are near the peak of the curve because of the ability of the present generation to use the powerful tools of modern industry on *new, unexploited* land. When this reserve of virgin soil approaches an end in quantity, or, what amounts to the same thing, decreases markedly in quality, population increase must diminish.

I hold that this period is approaching rapidly, and that it is high time for every progressive nation to concentrate attention on its problems of population and agriculture.

Fundamentally, the task in agriculture is the production of the primary foods, the plants. Food animals, though perhaps necessary in any permanent system of farming, are secondary products. Let us, then, give the problems of agronomy our attention.

Considering productivity alone, the agriculturist must keep in mind the plant, the environment, and the methods of forcing the plant to get the most out of its environment. Both the present status of agriculture and its future prospects can be outlined fairly well by a glance at the facts under these headings.

The food of the human race may be divided into cereals and starchy vegetables, legumes and nuts, vegetables and fruits, meat and meat products, oils, and sugars. It has been eating these products from time immemorial. Not a single food product of first importance has been brought into cultivation within historic times. Primitive man everywhere found out that his dietary needs were rather circumscribed. He came to pretty much the same conclusions in various parts of the world even as to the proportion of protein, carbohydrates, and vitamine carriers necessary for his welfare. He wasn't aware that certain oils carried a fat soluble vitamine or that vegetables and fruits carried water soluble vitamines; but he found that these products contributed to his well being, and he forthwith used them. Now no one can predict absolute failure for future efforts to introduce new food products into general use which will supplant some of those now in use, because of easy production in quantity. But isn't it more than a guess to suppose that if savage tribes in widely separated parts of the world came to use cereals, vegetables and fruits from the same families, that if even their narcotics and their arrow poisons were related, the next few thousand years will bring no revolutionary discovery in this field? There will, perhaps, be a more general use of certain fruits and meats which are now confined to rather narrow limits, but after a rather intensive study of the edible products of the world and their wild relatives, I, for one, must remain skeptical as to probability that the future will bring us anything new of importance.

On the other hand, no one can deny that we are not now utilizing every food resource at hand. When the population pressure all over the world becomes really heavy, we shall reform. We shall not only cultivate more land but we shall cultivate it more intensively. And we shall take real advantage of the sea and its denizens. Whales, seals, sea lions, fish not now found in any markets, molluscs, and sea weeds will furnish food for millions. At the same time it does not do to be too sanguine as to the immensity of these prospects. I have recently read a cheerfully optimistic book on The World's Food Resources, by J. Russell Smith.[2] Dr. Smith appears to believe that the world can go on increasing indefinitely both in people and in happiness because of the unused food ready for the taking. The probability that there will be diminished returns in getting this food to the consumer does not interest him at all, which fact makes his very readable book more of a menace than a consolation to the uncritical layman.

Several botanists and agriculturists who admit the improbability of the domestication of new plants having great economic value, and do not overestimate the relative importance of the unused wild fauna and flora, put their trust in new varieties of plants and new breeds of animals to be evolved by the scientific breeders of the future. Here again one must be very careful not to make too great a cry over little wool. Theoretical plant breeding and animal breeding under the newer name genetics have made tremendous advances in the past twenty years. We really have some fair idea of the rate at which certain organisms vary, the type of variations which occur, and the mode by which these variations are transmitted in inheritance. This knowledge places us in a much better position than ever before for predicting practical results. Personally I believe the whole matter shapes up something like this. Useful variation in the domestic plants and animals is very rare. The prospects of increased yields and better quality of food products through straight selection of variant individuals are extremely low. The real point of attack is through hybridization; yet even here it is doubtful whether a betterment greater than from ten to twenty per cent can ever occur. The great cereals, vegetables, fruits, and domestic animals all belong to ancient species which have wild relatives that will cross together and give partially fertile hybrids whose progeny are inordinately variable. Selection from among the types thus produced probably gave the useful varieties of today; and it is undoubtedly true that by the constant labor of organized workers scientifically trained, similar procedure will give the world better strains of these products, for the one thing that our modern science has done is to teach us how to save time.

[2] New York, Henry Holt, 1919, pp. 634.

We cannot hurry Nature to any great extent, but we can eliminate useless effort. Instead of growing large quantities of first generation hybrids and making selections among them, selective elimination is made solely in the second hybrid generation where the recombination of types is found. Instead of worrying about the supposed evil effects of inbreeding, advantage is taken of the process in fixing types. Instead of working solely for stability of characters, the vigor of hybrids is utilized. Thus agriculture benefits by pure science in the same way as engineering or chemistry: the short cuts are found and put into service.

But when all is said and done, one must remember that no new processes are involved, and the few time-saving devices now used, or in the prospect of being used, for the evolution of new forms of plant and of animal life, are not going to increase our resources by leaps and bounds. The prospective increase is relatively small. The development of plants and animals under domestication has been going on for thousands of years by these same methods and the type of labor saving device we have described will only hasten matters a little. There will be no revolution. Furthermore, let us suppose that the maximum prediction shall be realized. By the expenditure of time and money for breeding projects on a scale at present beyond the dream of the most enthusiastic propagandist, current production will have been increased by 20 per cent. Is this a consummation devoutly to be wished or not? Perhaps it is merely a vehicle for exploiting a limited store of soil fertility at a greater rate, a means of dissipating capital more rapidly.

In a word, then, the prospect of newly domesticated plants supplanting those already in cultivation is negligible, the probability of increased productiveness from new varieties of the old species is much lower than is generally supposed and is contingent upon an organization and a subsidization not to be expected under present governmental policies either here or abroad. The brightest ray of hope is an increasing return per unit of area by efficient application of the best methods of crop rotation, tillage, protection, harvesting and marketing, made possible by increasing the amount of man power used. In other words, there must be a movement back to the farms, which can come only if the returns in money, comfort and satisfaction on the farms are equivalent on the average to those obtained in other walks of life.

Such general application of scientific agronomical methods as has come about in the United States during the past generation, has yielded wonderful results; but these results are difficult to demonstrate statistically. Wheat yields by decade averages from 1866 to 1915 were, 11.9, 12.3, 12.7, 13.5 and 15.0 bushels per acre. Corn yields for the same periods were 26.1,

25.5, 23.4, 25.2 and 26.6 Other crops would show similar curves. There were slight increases in production per acre, but the percentage rise is disappointing.

Actually, the true increase in production per acre due to more efficient and intensive methods of farming is really worth while. It may be as high as 50 per cent. *But it is offset and masked by the bringing into cultivation of poorer new lands, and by the impoverishment of certain of the older lands.*

Unquestionably, the universal adoption of the best methods of crop production, storage and distribution, holds out the possibility of increasing the world's food supply enormously on the present acreage. The possibility, if all of us were supermen, might be as high as 200 per cent; the probability, since we are not, is somewhere around 50 per cent. But even so there is a counter blast to this optimistic hope that comes perilously near wrecking it entirely. I cannot see in this prospect anything but temporary expediency. The limiting factors in food production are soils and climate. *In any permanent system of agriculture the soil and the climate are the true arbiters of production.* It is all very well to hire an efficiency expert to run a coal mine, but the first requisite is to have the mine.

Let us then discuss soils. Climates will have to take care of themselves. We can do little to make or mar them.

I am sure we do not care to take up a technical treatment of soils here, although it is not an exaggeration to say it is the most important subject in the world. Soil, common black earth, is the limiting factor which shall determine, not only the number of people the world may contain, but also their comfort and therefore the trend of their civilization. The main points of our present knowledge of soils and the bearing they have on present and future productivity can be presented without recourse to technicalities, however; and this will serve our purpose.

The soil itself, the home of the plant, consists of minerals, water, gases and the dead remains of various organisms; but it is affected markedly by all sorts of living plants, from bacteria to flowering types, by animals such as earthworms, and by various forms of radiant energy. It is clear therefore that the study of soils is a complex matter necessitating the energies and the knowledge of chemists, physicists, physiologists, zoölogists and botanists; and it will undoubtedly be many years before there can be a precise classification of the activities which are mixed up in crop production. Nevertheless one can clear the field for current discussion by eliminating certain things. A thousand absolutely essential factors may be involved in producing vegetable foods, but if some of these factors are never absent, if others can be influenced but slightly, interest centers on the remainder.

Now a great many of the problems of agriculture are simply those of mutual adjustment. For example, plant growth of economic importance is limited by the natural water supply, with the exception that a small amount of land may be made available for crops by artificial irrigation; but all plants do not utilize the same amount of water, and agriculturists endeavor to fit crops to the environments they require. The same thing is true of energy requirements. One variety may suit the south, another the north; one type may fit shady ground, another may grow only in the sun. Again, it is possible to make readjustments of the natural fauna and flora of a soil so that the services performed by the lower animals and plants shall not be lacking. The soil questions of greatest importance thus boil down to those known as the problems of soil fertility.

One thing upon which all authorities agree is that natural soils differ in their productivity, and that particular methods of treatment may enhance or lessen this productiveness. Upon the proper interpretation of these acknowleged facts depends the whole future of the human race. Upon the truth as we see it today, therefore, should depend our attitude toward current agricultural policies.

The ideas of soil fertility accepted by most chemists and physicists have grown out of the theories advanced by the father of organic chemistry, Liebig. He showed that crops removed various elements from the soil. In particular, there were three, nitrogen, phosphorus and potassium, which were removed in large quantities and in which many soils might soon become deficient. His remedy was the application of compounds containing these elements to the soil. Thus he endeavored to give a chemical justification to the ages old empiric application of certain materials to the soil as fertilizers.

The Liebig theory is an exemplification of the old adage: you cannot eat your cake and have it. If you use up the natural fertility of the soil, it is gone. Four minus two is two.

Elaborations of this theory have been generally accepted. We cannot consider critically all of the reasons why it has found acceptance. Thousands of controlled experiments have been made, and with the most concise abstracts possible the discussion would run into several volumes. Suffice it to say that they all point to the truth of the following points: (1) With the exception of the three elements nitrogen, potassium and phosphorus, all ordinary soils contain practically inexhaustible quantities of the elements essential to plant life. (2) Application of nitrogen, phosphorus and potassium to soils which are deficient in them nearly always give increased plant growth. (3) Application of a single one of these elements to soils

where that element alone is deficient, gives a similar increase. (4) Application of one or more of these elements to soils in which chemical analysis shows there is no deficiency, results in little if any increased growth.

It seems to me no extended argument on these points is necessary. Plants will not grow without nitrogen, phosphorus and potassium, and these three elements exist in very limited quantities in most soils. The amounts removed by the plants can be calculated with great precision, and the amounts lost through leaching can be estimated with a fair degree of accuracy. The result, by the arithmetic commonly in use, is to find that the majority of soils cropped intensively without fertility replacement have a "life" ranging from a few generations to a few hundred years. Of course one can not calculate a period at which a soil will become absolutely unproductive, for the crops merely diminish at a more or less constant ratio, but one cannot only calculate, he can actually point to experiments of the Rothamstead and of the Illinois, the Ohio and other agricultural experiment stations, where continuous cropping for a quarter of a century without rotation or the use of fertilizers has brought the crop return to a vanishing point so far as economic profit is concerned.

Unfortunately too many people fail to realize the gravity of this situation. They feel that since the world has "carried on" in the past, it will "worry through" in the future. There is a *laissez faire* policy in agriculture as well as in politics. They argue that as numerous soils in Europe show an increasing productivity after "thousands of years of cropping," as the use of fertilizers is comparatively recent since the German potash deposits were only opened in 1862, and the composition of these soils compares favorably with that of rich soils in the United States, it is impossible to maintain that soils wear out. One might well rest the defence on common knowledge of arithmetic, as before, but there are some concrete statistical fallacies in this argument which should not be passed over in silence.

In the first place it should be realized that Europe has not been cropped to death for thousands of years to support an exceedingly numerous population, as is supposed by certain writers. A careful examination of the available statistics of population in England, France and Germany, leads to the conclusion that Europe as a whole has just about *tripled* in population during the last century. Europe, then, is only now being cropped to death; her soils have not really been tested out for centuries. Further, the statistics of crops cited are evidently from particular farms. Only very up-to-date efficient plantations would keep records for decade after decade. Whether they came from especially rich farms or not, any increase in crops could undoubtedly be attributed to a gradual infusion of modern methods of

tillage, crop rotation and machinery. And if this be not enough to account for the results, one can turn to the use of fertilizers, for although the use of pure chemicals is modern, the use of stable manure on crops is probably as old as husbandry. Do you recall Streeter's "Dere Mable" books? In one place he says: "You can tell how rich a Frenchman is by the size of his manure pile. The bigger the pile the bigger the man you are in your home town. All I can say is, 'I'm glad the people we live with are poor. I'd hate to be billeted with the Mayor.'"

This is not only France, it is all Europe. Only by painstaking conservation of the better soils has Europe managed to come as near to feeding her population as she has, and still she is on the wrong side of import-export ledger by millions and millions of tons annually. We have not reached the point where necessity brings such careful husbanding of resources. We are the prodigal heirs; nevertheless the day of accounting is on the calendar.

We have a comparatively new, supposedly inexhaustible country here. Its problems of population and their sustenance may be presumed to be light and easy as yet compared with those of some of the older parts of the world. But the problems are the same in type. We are approaching those already met by the Chinese; are we confronting those which will be met later by the colonizers of Africa and South America? If we turn our attention to our own problems, therefore, we will view in miniature those of the world; and in addition there will be something of a personal interest in the matter.

Since we began to take the census in 1790, a short space of 120 years as history goes, we have expanded from a floor space of 200 million acres and a population of 4 million to one of 1903 million acres inhabited by nearly 110 million people. The genius of the American people for building up their homeland has made things progress nearly as rapidly as our childhood friend the genius of Aladdin, the slave of the lamp. The land has been spanned by a network of railroads. Cities have appeared as if by magic. Industry has expanded by leaps and bounds. Wealth has been at hand for the taking by any resolute character with the courage of his convictions. Just such men were our forefathers, and they prospered beyond the dreams of Midas. And under the governmental policy of encouraging individuality who could say them nay? Yet this policy of "each man for himself" with no plan for the conservation of natural resources, may result in the metaphorical fulfillment of the remainder of the proverb, and "the Devil will take us all." Surely no thoughtful man now denies that there has been a tremendous waste of coal and oil, of the metals and the timber, and last but

not least of soil fertility. We have had a master passion to expand as rapidly as possible, without thinking that we were emulating the prodigal son in running through his patrimony. But prodigals we were and are.

It is curious what false ideas in regard to the remaining agricultural possibilities of the United States are held by so many people. They seem to feel that the country is a kind of a Ceres' cornucopia with no bottom at all—a never ending supply of the fruits of the earth. Not long ago I asked a well trained business man how much more land he thought could be brought in cultivation. His off-hand estimate was between 400 and 600 per cent—a rather astounding guess.

As a matter of fact half of our land total of 1903 million acres is now in farms, though it has not paid thus far to improve and cultivate all of it. There remains a reserve of over a billion acres, it is true; but nearly half of this is arid land having a precipitation of less than 15 inches, and less than 10 per cent of that will become available after the completion of all irrigation projects possible under the present system of construction. When one adds to this a proper allowance for permanent forests, for unusable swamps, and for cities, roads and railroads, there are something like three-quarters of a billion acres which must be forever withheld from agricultural use. There is left 300 million acres, roughly 35 per cent of our present farm lands, which may be incorporated with them. Thirty-five per cent is some reduction from the 600 per cent estimate, isn't it? And in this connection there is another matter where one is likely to go wrong. There are no rich new valleys and fertile virgin plains to be brought under the plow when the need arises. This 35 per cent is the poor expanse of waste passed by as worthless by the farmers of today and yesterday. It will be cultivated sometime when our descendants come to that point of subsistence pressure, but not until the half of the land now in farms but used as woodlots and pastures, has been made to yield to the plow and harrow, and not until food prices reach a point where the contemporary growlers about profiteering look back at the prices of 1920 with eyes of envy.

But let us see what we are doing with the land we are using: Is there any method of showing whether the returns are increasing or diminishing? It is a difficult question to decide because of the complications involved, but personally I believe there is conclusive evidence that the output per man is diminishing, despite the improved varieties of the staple crops and the new machinery for tilling them, despite the more general adoption of crop rotations and pest control measures. It is only natural that this should be so. It is the general history of every country. The cream is skimmed off during the early years of cultivation by extensive methods. The more

intensive methods prevail; and the yield per acre increases, while the yield per man decreases.

There was a great expansion of farming here during the seventies and eighties. The rich lands of the middle west were *cultivated extensively*. Low yields per acre were obtained because of these methods, but the number of new acres utilized was so great that overproduction and extremely low prices resulted. More recently there has been a trend toward intensive farming, hence an increased yield per acre and a lowering of the production per man. For example, the average yield of all crops between 1908 and 1918 was about 15 per cent greater than that between 1880 and 1890, but it took a considerably greater expenditure of man power per acre to get this yield. Those who point out that we have not reached the yield per acre of the best farmers of Europe would do well to remember this point. The most intensive farmers of Europe, the Belgians, cultivate about 5 acres per man; in the United States the comparative figure is 26 acres. We shall come to the European figures of production on a part of our area in time, but at the cost of more toil than is expended on a unit area today. This tendency is perhaps most clearly seen by comparing the increase in population in the decade 1900 to 1910 with the increase in farm lands. The first was 21 per cent, the second only 4.9 per cent, yet the people were fed. Furthermore, see what the farmers did in 1919 with very few extra men, merely by working harder themselves, when there was an incentive in extraordinarily high prices. The acreage of cereals alone was 33 millions greater than the average from 1910 to 1914. But it is also clear that these matters are determined by the economic laws which do actually prevail—prices controlled by supply and demand. What we wish to talk about is another thing.

If a multimillionaire shoe manufacturer should throw millions of pairs of shoes on the market at less than the cost of production, the prices of the shoes of other manufacturers would be forced down in consequence. The fact that the altruist of the shoe trade was using up his capital would not affect the response of the shoe market. Similarly farm prices and gross production are responsive to the same economic laws. Whether the farmer is using up or conserving his soil fertility capital, makes not the slightest difference. But it does make a difference to the future of the country.

Now the United States is not really a food exporting country. Normally we are now consuming what we produce. In the years 1911–1914, the total average export of foods was 52,746 metric tons less than the imports, yet for the four war years the annual average export balance was 3,169,495 metric tons. The United States was again made a great exporting nation during the war by high prices. The people did not eat less food except

in rare cases. Pearl[3] has shown that the per capita food intake continued about as high during the war as it was immediately before. They wasted a little less, as is shown by the garbage collection figures, and they changed their diet somewhat to meet the requests of the Food Administration; but they not only ate as much food per capita as before, they demanded it in the most expensive form. The exportation was possible because the annual food production in kilograms per capita increased from 888.7 for the three pre-war years, to 918.5 for the war period. And this was wholly an increase due to price stimulus.

Now when we forget about the war and go back over the *production figures per capita* from 1870 to 1916, we find that meat has decreased markedly and total food production slightly. We are still getting plenty to eat, but overproduction and cheap food have stopped. This is as it should be. What I am concerned about is this. The time for easy food production from virgin lands has vanished. Fertilizer consumption has increased by leaps and bounds. Some farms have been abandoned through depletion to the point of exhaustion, though it is true abandonment is largely for other reasons. New lands less productive in nature are gradually being put under the plow because prices are such that they yield a fair return. Intensified farming is increasing. In all this there is every evidence of diminishing returns in agriculture, yet few take any thought of what it means.

This is what it means. The farmers of the past century received in trust the agricultural capital of the country. The people gave it to them without asking them how they would use it. These trustees have drawn on the capital, and they have done this because they were forced to do it. They were told, in effect: "We have given you this land for nothing. Don't treat it as if it were the capital assets of a big business. Go to it and produce us food, and we will pay you just the wages of your labor for it. Take no account of the depreciation." This is bad bookkeeping. It is ill use of the Nation's resources. But it has not been the fault of the farmer. He has done just what he was forced to do. The result is that the potential, and in many cases the actual producing power of the soil, has been diminished. We have fared well by taking no account of how our children will fare. We are coming to a point, however, where diminishing returns will become more and more in evidence. Perhaps then we shall do something to counteract our previous neglect. If we do not do it, if we continue a *laissez faire* policy, we shall continue to fare well for a time and then the pressure will become serious in a very short time. There will come the day of reckoning. If we do have the forethought to inaugurate a permanent

[3] Pearl, Raymond. The Nation's Food. Saunders, Phil. 1920, pp. 274.

progressive agricultural policy, we shall have to pay an immediate premium on our future insurance, but will it not be worth it?

You no doubt will ask what I have to suggest? There are many sound proposals that one could make, but our time is too limited to do more than to sketch them roughly. And besides no one could present proposals satisfactory in detail without much more careful study than I have been able to give the matter.

Perhaps the most helpful means of putting agriculture on a sounder basis is an indirect one—severe permanent restrictions on immigration and possibly temporary prohibition. Since 1820, 28 million immigrants have arrived at our shores, and at the last census only 53.8 per cent of the population were native whites, born of native white parents. These newcomers have been welcomed and possess all the rights and privileges of the oldest inhabitants, yet it is wholly proper for those on the grounds to forbid further entrance if that be necessary. Is it not necessary? Any present cry for immigration can only be made by fools, hypocrites or ignoramuses. We have grown too fast already and have not moulded our population into a single nation. Those who call for immigrants wish to exploit their labor at low wages, not realizing that cheap labor is generally the most expensive in the long run. Our later immigrants have found their ways largely to the cities where they have been engulfed in the maw of the factory, giving the farmers still more mouths to feed besides tempting the native farmer boys away by seemingly larger wages to be their superintendents. An increased number of mouths to feed does not solve the food production problem, particularly when many of the owners of these mouths are hardly productive enough to earn their keep. The only solution of this predicament, from a purely business point of view, is to pay the immigrant the starvation wage which the pro-immigration propagandist hopes to pay him. But fundamentally this is neither good business policy nor good ethics. It is no doubt the memory of short periods of such treatment, that makes many aliens who may now be receiving more than they really earn, lend ear to any pernicious radical propagandist with an ax to grind. No! If we are to settle this great economic problem, we must not only cut down this too rapid expansion of population through immigration, but should cut the native birthrate as well—if it be done in the right place.

There should be no misunderstanding of the wise position to take on this phase of the problem. Certain transportation companies have always been willing to betray the country into accepting undesirables for the thirty pieces of silver involved in a steerage passage. There are those whose love of race is stronger than their love of country, hoping to transplant their

kindred root and branch to this more fertile garden spot. And there are the pure exploiters. With their wiles and intrigues we cannot deal here. But in addition there are numerous dabblers in sociology who honestly believe immigration should be encouraged for the twofold good of the immigrant and of the country. To such as these one may say: "Do you realize that emigration from a populous country relieves but a few individuals, and that there is an immediate increase in the birthrate which soon restabilizes the economic pressure? Do you realize that the immigrant always comes with a lower standard of living, and that because of his individual inability to produce enough to reach the new standard which he meets, he tends to lower it by his competition? Do your realize that the unrestrained fertility of the new arrivals depresses the fecundity of the native sons and daughters who know that the time of diminishing returns has come? Do you realize that only a comparatively small natural increase in population is possible for this country if there is to be time for the economic readjustment required by diminishing returns?" If he is thoughtful, if he is open minded, if he is really worthy his place in the State, the immigration policy of the future will be solved.

Second, there must be a reorganization of what is already being done for the farmer by means of the United States Department of Agriculture and the State Experiment Stations. I do not mean by reorganization a radical change in present policies, for these institutions are doing wonders. There might well be some greater attention paid to pure science, since if no heed is given to increase of knowledge, diffusion of knowledge is hampered. What I meant was an expanded investigational and pedagogical aid to agriculture reorganized financially. There ought to be a lot of $20,000 men in this work, and they ought to get $20,000. Even if there were enough high class men to be found to occupy these places at starvation wages, it is beneath this country to demand it.

Next the farmer's financial way should be made as easy as possible. Farming of the right sort should be made attractive. Something is now being done in the way of extending credit. This will help matters, if properly handled. But the kind of operation carried out by the Farm Loan Banks does not really get to the bottom of things. The true financial worry of the farmer comes from having to plant his maximum acreage from six months to a year before he receives his returns, without having any idea of the price he is to receive for his labor. He not only has to plant, but he has to plant pretty much the same crops as he planted the previous year, for proper farming means specialization. He is therefore between the upper and the nether millstones.

Now I am sure I can give no concrete remedy for this problem. It is too big and involved for off-hand solution. Yet it must have a solution, even though it be somewhat imperfect, if the nation is going to make the most of its resources. Solutions should be worked out by experts and Congress forced into line to try them out. Something can certainly be done to give the farmer a return for his products that is based on the cost of production, as in any other business; and that is all he asks.

As a beginning it would seem to be possible to increase the facilities for distribution, and to decrease the margin of profit between the producer and ultimate consumer. There are necessary and legitimate charges for the transportation, storage, manufacture and retail marketing of food. Whether the profits made by those who undertake these tasks are unreasonable or not, is not at all clear from the available statistics. It is clear that the methods in use are unscientific and wasteful to an absurd degree, that they are needlessly involved and complicated, and that they are practically free from governmental supervision. The result is a price fluctuation governed by supply and demand which works to the detriment of the public good. The farmer is affected first by any fall in prices through overproduction. He forthwith curtails too much, benefits a little by increased prices, and forces great hardship on the ultimate consumer. Any breakdown in the chain between the farmer and the consumer also reacts sharply and quickly against the latter, though the reaction ultimately reaches the producer.

The mechanism by which this muddle is to be clarified is for the future to reveal. It may be built up by government supervision, it may be evolved through the initiation of active coöperative marketing and buying; but whatever the general means to the end, the problem is one having several sharply defined phases:

1. Accurate and comprehensive agricultural statistics should be collected and made available quickly. With these facts as a basis the government should be able to keep its hand on the throttle of agricultural production, and should be able to prevent serious excess or deficiency in each crop subdivision. By similar advisory work, it should gradually be possible to have the food resources of the nation marketed more nearly continuously throughout the year. Both glut and scarcity might thus be avoided.

2. Transportation should be facilitated in every way consistent with industrial economy.

3. An analysis of the means and the costs by which food passes from producer to consumer should be made, with a system for more direct marketing and lessened middleman costs as the outcome. A markedly

successful effort toward this end was made by the United States Food Administration during the war, so it is not a mere dream.

4. Deliberate speculative manipulation of food prices should be prohibited.

5. Hazards of buying and marketing on short-time contracts which are necessarily attended by somewhat of the speculative should be reduced to a minimum by whatever means is found adequate.

6. An agricultural foreign policy should be inaugurated which will have as its primary aim the stabilization of prices and the conservation of soil wealth.

With even a semblance of a solution to these important questions[4] we shall have what we have not had before—an agricultural policy encouraging a continuous normal food production per capita with price fluctuations reduced to a minimum, simply through giving the farmer a square deal.

The final suggestion is forecasted by the arguments set forth earlier. In last analysis the future food supply of the world depends upon the conservation of soil fertility. Our soil fertility is the greatest single asset of the nation, and it should not be permitted to be dissipated. The campaign for a truly permanent system of agriculture where productivity is kept high without soil robbery should not be allowed to lapse, but should be prosecuted more and more vigorously. Through proper rotation of crops, the return of waste products to the soil, and the use of our comparatively unlimited supply of fertilizers, this may be done. We do not want to wait until necessity presses us to adopt some of the methods of the Chinese.

Listen to what King,[5] the only soil expert of the United States—so far as I know—who studied the subject on the spot, says of Chinese and Japanese practice:

"In China enormous quantities of canal mud are applied to the fields, sometimes at the rate of 70 tons per acre." It may be said in passing that China has 200,000 miles of canals built for agricultural as well as for purely commercial purposes. "So, too, where there are no canals, both the soil and subsoil are carried into the villages and there between the intervals when they are needed they are, at the expense of great labor, composted with organic refuse and often afterwards dried and pulverized before being carried back and used on the fields as homemade fertilizers. Manure of all kinds, human and animal, is religiously saved and applied to the fields in a manner which secures an efficiency far above our own practices.

[4] Cf. Hoover, H. C. Some notes on agricultural readjustment and the high cost of living. Sat. Eve. Post, April 10, 1920.

[5] King, F. H. Farmers of forty centuries. Mad. pri. pri., 1911, pp. 441.

"Statistics obtained through the Bureau of Agriculture, Japan, place the amount of human waste in that country in 1908 at 23,950,295 tons, or 1.75 tons per acre of their cultivated land. Japan's production of fertilizing material, regularly prepared and applied to the land annually, amounts to more than 4.5 tons per acre of cultivated field exclusive of the commercial fertilizers purchased."

I leave this quotation with you as a parting word, to be remembered, I hope, as a real lesson, which teaches that forethought now is the only method of assuring an adequate future food supply.

THE SELECTIVE ELIMINATION OF MALE INFANTS UNDER DIFFERENT ENVIRONMENTAL INFLUENCES

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It is a well known fact that more males than females die in the first year of life. Although several explanations of this circumstance have been offered, many facts indicate that the male is less hardy and vigorous than the female and more easily succumbs to the hardships and diseases of infancy. Since males differ from females in their hereditary constitution, their more rapid elimination in infancy and early childhod may be regarded as indicative of the action of natural selection. From the standpoint of natural selection the male represents a relatively unfavorable variation which is constantly being discriminated against and which is suffered to continue in existence by virtue of a peculiar mechanism of sex determination which insures his continued production.

There has been much discussion as to whether the death rate in infancy is selective. While it would appear to be highly probable *a priori* that infants with inherent weakness or defect would be the ones most apt to die, it has been claimed that infant mortality is practically indiscriminate in its action, killing off the naturally robust almost as rapidly as the weaklings. All infants are frail, helpless and easily succumb, and since infant welfare is so closely dependent upon food, climate, and care, it has seemed to many that the rôle of selection must be a very subordinate one and that the reduction of infant mortality, which is now going on so successfully, will have practically no undesirable influence upon the average quality of the survivors. This conclusion is accepted all the more readily because it eliminates an element of doubt concerning the unmixed benefit arising from recent efforts toward saving infant life.

The problem of how far the infant death rate is really selective presents many difficulties. Pearson, Snow, Greenwood, Ploetz, Brownlee, Newsholme and several others have studied the subject and arrived at opinions of the most diverse kind. If some children die of scarlet fever, for instance, while others do not, it is no easy matter to ascertain how far the different fates of the two lots are due to differences in hereditary qualities.

It occurred to the writers that one way of approaching the problem would be to study the relation between the relative mortality of the two sexes and the various conditions which affect the severity of the general death rate in infancy. Here is one sex differing from the other in its chromosome complex and this means, to a certain extent, difference in hereditary factors. As a result of these factor differences there arise, directly or indirectly, constitutional differences which render one sex more likely than the other to succumb to the untoward agencies affecting infancy and childhood.

The relation between unfavorable environment and the relative mortality of males and females has been discussed more or less incidentally by a few writers, but, so far as we know, without any reference to the problem of selection. In order to throw light on the problem, data on the subject have been compiled in a number of ways:

1. By following the changes in the death ratio of males to females through a number of years in countries where the infant mortality rate has been changing.

2. By comparing the death ratio of males to females in countries having a high infant mortality with those having a low infant mortality.

3. By comparing the death ratio of males to females of different social classes that have markedly different infant death rates.

4. By comparing the male to female death ratio of the infants of native born and foreign born parents in the United States, and also of negroes and whites.

5. By comparing the male to female death ratios of infants in urban and rural districts.

6. By studying the sex mortality of legitimate and illegitimate children.

There are several matters which must be kept in mind in comparing the infant mortality of different times and places in order to avoid drawing unwarranted conclusions. We lack an entirely reliable index of infant mortality. The most satisfactory and commonly employed index in general is the proportion of infants under one year of age who die during a given year, to the number of living infants born during the same year. But this index is not only affected by failure to record deaths, but also by the rather more usual failure to record births. In the United States, for instance, many births even in the Registration Area fail to become registered and hence the ratio of infant deaths to births indicates too high a degree of infant mortality.

In making comparisons of male and female infant mortality it must be remembered that more males should be expected to die because more of them are born. The sex ratio at birth, which varies from 104 to 106

males to 100 females is, as Gini has pointed out, one of the most constant and characteristic peculiarities of the various races and peoples of the human species. We may compare the death rates of the two sexes, employing as the male death rate the proportion of boy deaths under one year to boys born, and as the female death rate the proportion of girl deaths under one year to girls born. But while such a comparison avoids the source of inequality of deaths due to the sex ratio at birth, it introduces sources of inaccuracy in the denominators of our fractions, i.e., the number of males or females born during the year. The correctness of these denominators depends upon the completeness of the registrations of births and the birth records of different countries vary considerably in this regard. If for any reason the births of boys are more apt to be recorded than those of girls or vice versa our index of the relative *mortality* of the two sexes would suffer.

Comparisons of the relative mortality of the two sexes at birth at different times and places is perhaps best made by eliminating entirely the questionable element of births and considering only the deaths of male and female infants under one year of life. Relative sex mortality of infants may then be checked in the light of the sex ratio at birth, and as this varies but slightly from country to country our comparisons may be made on a fairly satisfactory basis. It was not always possible to secure statistics of the kind mentioned and a comparison of relative mortality rates of the sexes had to be used, but such data have been employed only to furnish subsidiary evidence for conclusions based on other grounds.

As a very general rule the farther we go back in periods of statistical record, the higher the infant death rate, but it is since the beginning of the twentieth century that the greatest improvements in infant mortality have been brought about. In England and Wales there was, in fact, little improvement in the infant death rate between 1841 and 1900, and even a slight rise in the four quinquennial periods between 1880 and 1900. During the twenty years of the present century the slaughter of the innocents has been greatly diminished. Before 1900 the ratios of male to female infant deaths show little change, fluctuating slightly back and forth in an irregular way. With the striking recent fall in infant mortality, we get an equally pronounced rise in the ratio of male to female deaths. In Sweden (table 2) infant mortality has taken a different course. It has fallen quite consistently during the long period (since 1751) which is covered by the statistics of that country. There has been also a general and parallel increase in the ratio of male to female infant deaths. Most other countries also show an increasing relative death rate of boys as their infant mortality has been reduced.

TABLE 1

Deaths of infants in England and Wales, 1841–1916 (From the Reports of the Registrar General of England and Wales)

YEARS	MALE DEATHS TO 1,000 MALE BIRTHS	FEMALE DEATHS TO 1,000 FEMALE BIRTHS	GENERAL INFANT DEATH RATE PER 1,000 BIRTHS	SEX RATIO AT BIRTH	RATIO OF MALE DEATH RATE TO FEMALE DEATH RATE IN 1ST YEAR
1841–1845	162	133	148	105.2	122.5
1846–1850	172	142	157	104.5	121.9
1851–1855	172	141	156	104.6	121.2
1856–1860	166	127	152	104.6	122.0
1861–1865	166	136	151	104.3	122.1
1866–1870	170	142	157	104.1	119.7
1871–1875	167	138	153	103.9	121.0
1876–1880	159	130	145	103.8	122.1
1881–1885	152	125	139	103.8	121.6
1886–1890	159	131	145	103.6	121.4
1891–1895	165	135	151	103.6	122.2
1896–1900	170	141	156	103.5	120.6
1901–1905	151	124	138	103.7	121.8
1906–1910	129	105	117	103.9	122.4
1911	142	117	130	103.9	121.4
1912	106	84	95	104.0	126.2
1913	120	96	108	103.8	125.0
1914	116	93	105	103.5	124.7
1915	123	96	110	104.0	128.0
1916	102	80	91	104.9	128.0

TABLE 2

Deaths during first year of life to 1000 living born in Sweden

YEARS	MALE DEATHS PER 1,000 BIRTHS	FEMALE DEATHS PER 1,000 BIRTHS	RATIO OF MALE DEATH RATE TO FEMALE DEATH RATE	YEAR	MALE DEATHS PER 1,000 BIRTHS	FEMALE DEATHS PER 1,000 BIRTHS	RATIO OF MALE DEATH RATE TO FEMALE DEATH RATE
1751–1760	214.4	194.4	110.2	1841–1850	165.2	140.5	117.5
1761–1770	225.7	205.9	109.6	1851–1860	157.3	134.2	117.2
1771–1780	210.8	192.4	109.5	1861–1870	149.2	128.2	116.3
1781–1790	209.3	190.1	110.1	1871–1880	140.1	119.1	117.6
1791–1800	207.2	184.4	112.3	1881–1890	120.0	100.5	119.4
1801–1810	211.4	185.3	114.0	1891–1900	110.7	92.0	120.3
1811–1820	196.2	170.0	115.4	1901–1910	92.6	76.0	121.8
1821–1830	179.0	155.0	115.4	1911–1915	79.7	64.4	123.7
1831–1840	178.7	154.4	115.7				

In general the male to female infant death ratios are higher in countries with a low infant death rate than in those with a high infant death rate. New Zealand has the lowest infant mortality rate in the world and the highest male-female infant death ratio. There are many apparent exceptions to this rule, however, but I suspect that they are due to difference in the methods of compiling statistics. One cannot make accurate comparisons of the infant death rates of different countries owing to varying completeness of birth statistics. In Great Britain and Ireland still-births are not

TABLE 3

Deaths under one year in the Registration Area of the United States, 1900–1919

YEAR	TOTAL POPULATION		WHITES		NEGROES		RATIO OF MALE DEATHS TO FEMALE DEATHS	
	Males	Females	Males	Females	Males	Females	Whites	Negroes
1900	62,244	49,443	57,940	45,722	4,304	3,721	125.9	115
1901	54,298	43,179	50,357	39,768	3,941	3,411	125.7	115
1902	54,913	43,662	50,933	40,364	3,980	3,298	125.8	116
1903	54,021	42,836	50,054	39,470	3,967	3,366	126.0	118
1904	57,545	45,335	53,538	41,695	4,007	3,640	126.7	110
1905	59,047	46,506	54,919	42,982	4,128	3,521	126.9	117
1906	74,484	58,621	69,700	54,558	4,784	4,063	127.0	117
1907	73,279	57,831	68,473	53,747	4,806	4,084	126.7	117
1908	76,209	60,223	71,475	56,239	4,734	3,984	126.5	118
1909	78,275	61,782	73,544	57,782	4,731	4,000	126.7	118
1910	86,230	68,143	80,952	63,698	5,278	4,445	126.5	118
1911	83,551	65,771	Data not given in U. S. Mortality				127.0	
1912	82,834	64,621	Statistics, 1911–1913				127.0	
1913	89,590	69,845					128.0	
1914	87,086	67,989	80,454	62,492	6,632	5,497	128.1	120.6
1915	84,047	64,514	77,627	59,239	6,420	5,275	128.7	121
1916	93,122	71,538	83,709	64,055	9,413	7,483	130.1	125
1917	96,951	74,073	86,104	65,274	10,847	8,799	130.8	123
1918	91,595	70,026	79,657	60,461	11,938	9,565	130.5	124
1919	109,282	84,573	96,873	74,111	12,409	10,462	129.2	119

reckoned as births and even many infants which die some days after birth are not recorded as born. The proportion of males among these premature deaths is very high and naturally the omission of all record of these would modify the sex ratio of those whose deaths are recorded.

The United States Mortality Statistics which have been published for each year since 1900 furnish abundant data covering a period in which the infant mortality has been rapidly decreasing. A part of this decrease may be merely statistical, due to increasing adequacy of birth records in the

Registration Area, but there can be no doubt that a large part of it is real. It is noteworthy that as the death rate has decreased there is an increase in the ratio of male to female deaths. It is perhaps significant that the male-female death ratio decreased slightly with the slight rise in the infant mortality rates in 1918 and 1919 which were probably a direct or indirect result of the epidemic of influenza (table 3).

TABLE 4

Infant mortality in Massachusetts, 1891–1918 (from the 77th Annual Report on the vital statistics of Massachusetts, 1920)

YEAR	MALE DEATHS UNDER 1 YEAR	FEMALE DEATHS UNDER 1 YEAR	RATIO OF MALE DEATHS TO FEMALE DEATHS	DEATHS UNDER 1 YEAR PER 1000 BIRTHS
1891	5,677	4,509	124	161.7
1892	5,898	4,751	126	161.7
1893	5,958	5,032	118	163.6
1894	5,999	4,900	122	162.8
1895	5,919	4,645	125	156.4
1896	6,568	5,197	126	157.8
1897	5,957	4,794	124	146.9
1898	6,092	4,920	124	150.6
1899	5,829	4,703	124	149.5
1900	6,476	5,024	128	156.7
1901	5,623	4,329	127	138.3
1902	5,568	4,507	123	139.5
1903	5,877	4,392	131	138.3
1904	5,596	4,396	127	133.2
1905	5,991	4,528	132	140.2
1906	6,293	4,813	131	138.4
1907	6,282	5,011	125	132.9
1908	6,563	5,043	130	133.5
1909	5,984	4,709	127	127.2
1910	6,458	5,041	128	132.9
1911	5,915	4,628	128	119.4
1912	5,855	4,617	125	116.5
1913	5,786	4,300	134	110.1
1914	5,580	4,314	129	105.9
1915	5,334	4,153	128	101.9
1916	5,303	4,031	132	99.8
1917	5,326	3,999	133	97.4
1918	6,120	4,698	130	113.2

Data from Australia and New Zealand are of particular interest for our problem on account of the remarkable reduction of infant death rate which has been brought about in these countries, New Zealand having the lowest infant death rate of the world. The country in Europe most closely

approaching the low death rate of Australia and New Zealand is Norway and here we find the same increasing proportion of male mortality although there is a good deal of annual fluctuation due doubtless to the relatively small number of infant deaths. Contrasted with this is Prussia which not only shows a high infant death rate, but has made relatively little improvement in this respect and shows little change in the relative mortality of the two sexes. Baden, on the other hand, although it has had a very high infant death rate shows a marked reduction of infant mortality and an increased

TABLE 5

Infant mortality in Australia

YEARS	NUMBER OF DEATHS UNDER 1 YEAR		RATIO OF MALE TO FEMALE DEATHS	INFANT DEATHS PER 1000 BIRTHS
	Male	Female		
1881–1890	63,278	52,709	120.0	
1891–1900	63,447	51,781	122.1	
1901–1910	52,000	41,364	125.6	
1901	5,888	4,778	123.0	103.6
1902	6,008	5,004	120.0	107.1
1903	6,003	4,960	121.0	111.3
1904	4,713	3,800	124.0	81.8
1905	4,884	3,696	132.0	81.8
1906	5,002	3,981	125.0	83.3
1907	4,993	3,952	126.0	81.0
1908	4,885	3,791	128.0	77.8
1909	4,604	3,559	129.0	71.5
1910	4,916	3,822	128.0	74.8
1911	4,745	4,624	131.0	68.5
1912	5,446	4,102	132.0	71.7
1913	5,472	4,328	126.0	72.21
1914	5,582	4,279	130.0	71.47
1915	5,127	3,980	129.0	67.52
1916	5,186	4,057	128.0	70.33
1917	4,232	3,034	139.0	55.91
1918	4,178	3,186	131.0	58.57

proportion of male infant deaths. Similar phenomena are shown in Bavaria, Saxony and Wurttemburg. An increase in the male-female death ratio has accompanied recent improvement in infant mortality also in France, Holland, Belgium, Austria, Italy, Denmark and Switzerland.

In making comparison of the infant death rates of city and country we have to make allowance for a number of sources of error. Urban and rural birth rates in terms of which infant mortality is measured are never given in their true relation. The increasingly prevalent custom among pregnant

TABLE 6

Deaths of infants under one year in New Zealand, 1898–1916

YEAR	MALE DEATHS	FEMALE DEATHS	RATIO OF MALE DEATHS TO FEMALE DEATHS	INFANT MORTALITY PER 1000 BIRTHS
1898	860	650	130.7	
1899	1,016	790	135.3	
1900	819	650	126.0	
1901	823	640	126.7	76.3
1902	952	760	125.0	82.9
1903	977	793	123.2	81.1
1904	933	683	136.6	80.35
1905				67.5
1906				62.1
1907	1,242	986	125.9	96.57
1908	1,007	754	133.5	74.24
1909	952	682	139.5	66.99
1910	992	768	129.1	70.63
1911	859	625	137.5	60.42
1912	805	604	133.2	56.04
1913	942	711	132.4	64.00
1914	828	628	131.8	55.25
1915	827	567	145.8	51.81
1916	830	616	134.7	52.61

TABLE 7

Infant mortality in Baden

YEARS	MALES	FEMALES	DEATHS UNDER 1 YEAR PER 1000 LIVING BORN	RATIO OF MALE DEATHS TO FEMALE DEATHS
1851–1860	6,310	5,028	255.5	125.5
1861–1870	8,113	6,498	277.6	124.7
1871–1880	8,402	6,847	261.7	125.9
1881–1890	6,776	5,420	229.1	126.0
1891–1900	7,001	5,554	216.6	125.7
1901–1910	6,887	5,470	187.8	126.0
1903–1912	6,475	5,131	179.3	126.0
1904	7,606	6,142	206.1	123.8
1905	7,290	5,722	197.1	125.0
1906	7,072	5,869	193.3	120.5
1907	6,469	5,078	174.6	127.4
1908	6,338	4,982	168.1	128.2
1909	6,359	4,877	172.8	130.4
1910	5,549	4,382	156.8	130.4
1911	5,895	4,630	174.7	127.3
1912	4,780	3,600	138.2	132.8
1913	4,555	3,492	138.1	130.4

women of going to some city hospital for delivery gives to the city the credit of many births which really belong to the country. In many European countries, and especially in France, it has been customary to send infants into the country to be cared for. This practice resulted in so high an infant mortality that the French Government enacted especial legislation to regulate the care of such infants. The deaths of these infants naturally swell the rural infant mortality and reduce that of cities. In several

TABLE 8

Deaths of native white children under one year in the United States of native and of foreign born parentage. Cities in Registration States

YEAR	BOTH PARENTS NATIVE			ONE OR BOTH PARENTS FOREIGN		
	Males	Females	Ratio of male deaths to female deaths	Males	Females	Ratio of male deaths to female deaths
1900	8,204	6,363	128.9	15,028	12,016	125.0
1901	7,536	5,846	128.0	13,448	10,787	124.6
1902	7,553	5,884	128.3	13,608	11,069	122.9
1903	7,203	5,697	126.4	13,448	10,584	127.0
1904	7,902	6,174	127.9	14,128	11,272	125.3
1905	7,750	6,048	127.1	14,774	11,624	127.1
1906	13,022	10,165	128.1	20,905	16,370	127.0
1907	12,432	9,881	125.8	20,573	16,412	125.3
1908	12,761	10,050	126.9	21,153	16,863	125.4
1909	13,679	10,695	127.8	21,989	17,489	125.0
1910	16,111	12,207	131.1	24,548	19,672	124.0
1911	15,562	12,104	128.5	22,716	17,852	127.2
1912						
1913						
1914	16,477	12,574	131.0	22,915	18,010	127.2
1915	15,597	11,724	133.0	21,932	17,186	127.6
1916	17,222	12,869	133.8	22,713	17,617	128.9
1917	18,200	13,561	133.9	22,087	16,652	132.6
1918	22,966	17,254	133.1	26,077	19,998	130.4
1919	19,220	14,332	134.1	19,865	15,418	128.8

countries and especially in the United States there is reason to believe that birth registration is not carried out with the same care in urban and rural communities and there are various other minor factors also which complicate the problem.

In many cities there has been a striking decrease in infant mortality in recent years. The data published before the beginning of the present century showed that urban rates of infant mortality were generally higher than the rural, although in some cases (Austria, Bavaria, Saxony, Wurttemberg)

the latter years of the century showed the reverse relation. In the present century infant mortality in many countries has shown a more rapid diminution in cities than in rural districts, and in some cases the urban rate (Prussia for instance) has fallen below the rural. In general the ratio of male to female infant deaths has been higher in cities than in the country. This is true in the United States for all the years for which we have records. In England and Wales the rates for 1905–1916 were as follows:

	Ratio of male to female deaths
London	122
Country Boroughs	124
Other Urban Districts	126
Rural Districts	128

Prussia shows a significant change inasmuch as the male-female death ratio, while formerly higher for rural infants (in accordance with the lower rural death rate) has recently become higher in the cities as a result of their more rapid reduction of infant mortality.

In both city and country in the United States infant mortality is higher among the foreign born than the native Americans, and the male to female death ratio is higher in the latter group; the difference being greater in the cities than in the country. Comparing negroes and whites, we find much sharper differences owing to the relatively high infant mortality rate among the negroes. For all the years since 1900, the male to female death ratio has been several per cent higher among the whites.

The evidence that is available on the subject indicates that the sex ratio at birth is very nearly the same for negroes as whites. All the United States Census reports giving the proportion of children under one year of age, however, show that for negroes the females outnumber the males, while the reverse is true for the children of white parents. This is due to the relatively high death rate of the negro children. Not infrequently, as shown by table 11, the infant death rate is twice or even three times that of the whites.

Inasmuch as more boys die in the first year than girls, the severe death rate among the negroes soon overcomes the initial preponderance of boys and leaves a larger number of girls than boys in the population under one year of age.

Statistics of illegitimate, as compared with legitimate children show in every country in which they are published that the ratio of male to female deaths is higher among the legitimate group, as we should expect on account of the high death rate among illegitimate children. The statistics of

TABLE 9

Deaths of native white children under one year in the United States of native and foreign born parentage. Rural part of Registration States

YEAR	BOTH PARENTS NATIVE			ONE OR BOTH PARENTS FOREIGN		
	Males	Females	Ratio of male deaths to female deaths	Males	Females	Ratio of male deaths to female deaths
1900	8,061	6,508	123.8	4,267	3,412	125.0
1901	7,026	5,389	128.5	3,450	2,674	129.0
1902	6,556	5,052	129.7	3,364	2,687	128.9
1903	6,716	5,138	130.6	3,383	2,737	123.6
1904	7,169	5,559	128.0	3,604	2,797	133.6
1905	7,412	5,778	128.2	4,128	3,114	132.5
1906	12,750	9,891	128.8	7,961	6,270	126.9
1907	12,278	9,368	131.0	7,820	5,975	130.9
1908	14,120	10,819	130.5	9,189	7,149	128.5
1909	16,264	12,354	131.6	9,646	7,621	126.5
1910	17,790	13,645	130.3	10,853	8,585	126.4
1911	20,368	15,976	127.4	9,535	7,518	126.8
1912						
1913						
1914	21,920	16,958	123.3	10,004	7,735	129.3
1915	21,569	16,148	133.5	10,028	7,607	131.8
1916	25,001	19,080	131.0	10,110	7,738	130.6
1917	27,111	20,651	131.2	9,564	7,332	130.4
1918	31,338	23,920	131.0	11,066	8,509	130.0
1919	27,876	21,020	132.6	8,346	6,339	130.0

TABLE 10

Ratios of male to female deaths in infants in whites and negroes by four-year periods in several states

STATES	1900 TO 1903		1904 TO 1907		1908 TO 1911		1912 TO 1915	
	Negro	White	Negro	White	Negro	White	Negro	White
District of Columbia	117.4	143.5	118.6	133.8	110.0	124.3	123.6	135.6
New York	115.1	123.8	116.6	124.1	118.7	123.9	122.5	123.2
New Jersey	128.9	127.6	121.9	126.4	127.2	128.3	118.2	123.4
Pennsylvania			121.7	129.0	120.1	127.2	118.1	129.7
Indiana	115.5	125.9	114.8	128.0	103.2	128.7	105.2	135.4
Maryland			115.4	124.4	118.7	122.4	118.1	131.6
Massachusetts	111.4	129.4	111.4	129.6	121.9	128.2	146.5	128.8

England and Wales show for the years 1905–1916 inclusive, a sex ratio for deaths of legitimate children of 126, while for the illegitimate it is 119 (see table 13).

Data from Germany based on a very large number of births (for the percentage of illegitimate births, especially in southern Germany, has been very high) show that year by year with remarkable uniformity the ratio of male

TABLE 11

Deaths under one year of age per 1000 population under one year in 1910

STATE	NEGRO	WHITE	EXCESS OF NEGRO OVER WHITE
District of Columbia	398.5	121.0	277.5
New York	308.3	141.7	166.6
New Jersey	291.5	144.3	147.2
Pennsylvania	284.1	147.0	137.1
Indiana	220.8	104.8	116.0
Maryland	238.0	131.9	106.1
Massachusetts	180.7	160.7	20.0

TABLE 12

Sex ratios of legitimate and illegitimate infants in Germany dying under one year

YEAR	LEGITIMATE		ILLEGITIMATE		RATIO OF MALE TO FEMALE DEATHS	
	Males	Females	Males	Females	Legitimate	Illegitimate
1904	191,490	153,482	28,903	23,906	124.7	120.9
1905	196,194	157,147	30,077	24,577	124.8	122.5
1906	181,088	143,504	27,534	22,510	126.2	122.3
1907	169,217	133,703	26,544	21,581	126.5	123.0
1908	172,624	136,056	27,636	22,705	126.8	122.2
1909	160,674	127,528	25,999	21,233	126.0	122.4
1910	149,039	118,132	24,378	19,913	126.1	122.4
1911	171,036	137,729	27,780	22,977	124.2	122.9
1912	131,512	103,032	22,697	18,330	127.6	123.8

deaths among legitimate infants is a few per cent higher than among the illegitimate. For the years 1904–1912 this is shown by table 12.

Data from a variety of sources thus agree in indicating that where the infant death rate is relatively low, there is a relatively high mortality of the male as compared with the female sex. But an apparently different relation is shown when we pass, in the history of the individual, from *periods* in which the mortality is relatively low to those in which it is relatively high.

TABLE 13

Infant mortality—percentage of mortality of males to that of females in England and Wales, 1905–1916 (Report of the Registrar General of England and Wales, 1917–18)

	ALL INFANTS	LEGITIMATE INFANTS	ILLEGITIMATE INFANTS
Under 1 day	129	131	114
1 to 7 days	132	133	120
Second week	130	131	121
Third week	132	133	131
Fourth week	130	131	125
Under 1 month	131	132	119
1 to 2 months	136	137	132
2 to 3 months	127	127	124
3 to 4 months	122	121	120
4 to 5 months	124	125	120
5 to 6 months	124	124	113
6 to 7 months	121	121	115
7 to 8 months	120	121	115
8 to 9 months	115	115	113
9 to 10 months	114	114	113
10 to 11 months	111	112	112
11 to 12 months	111	111	101
Total	125	126	119

TABLE 14

Death percentage at each month in first year in England and Wales, 1838 to 1854 (from Farr's Vital Statistics, 1864)

AGE IN MONTHS	MALE DEATHS	MALE DEATHS PER 1,000 BIRTHS	FEMALE DEATHS	FEMALE DEATHS PER 1,000 BIRTHS	RATIO OF MALE DEATH RATE TO FEMALE DEATH RATE	RATIO OF MALE DEATHS TO FEMALE DEATHS
0–1	26,787	65.50	19,716	49.45	132.4	135.8
1–2	9,640	24.09	7,555	19.50	123.5	127.6
2–3	6,758	17.18	5,420	14.19	121.0	124.6
3–4	5,598	14.42	4,502	11.91	121.0	124.3
4–5	5,320	13.86	4,230	11.30	122.6	125.7
5–6	5,044	13.29	3,989	10.76	124.2	126.4
6–7	4,771	12.71	3,776	10.27	123.7	126.3
7–8	4,498	12.11	3,589	9.84	123.0	125.3
8–9	4,229	11.50	3,428	9.48	121.3	123.3
9–10	3,959	10.86	3,294	9.18	118.3	120.1
10–11	3,691	10.22	3,181	8.83	114.4	116.0
11–12	3,424	9.56	3,094	8.75	109.2	110.7

It is well known that infant mortality is exceptionally high in the first month of life, and that in the first month more die in the first than in any subsequent week. From the period of birth on to several years of age, the child's hold on life becomes more secure with each passing day. There are several reasons for believing that this increasing expectation of life is

TABLE 15

Deaths under one year in Germany to 100,000 born, 1901–1910

MONTH	MALE	FEMALE	RELATION OF MALE DEATH RATE TO FEMALE DEATH RATE
1	6,539	5,129	1.276
2	2,421	2,001	1.209
3	2,076	1,713	1.211
4	1,736	1,476	1.176
5	1,443	1,223	1.179
6	1,214	1,043	1.166
7	1,065	945	1.127
8	917	833	1.100
9	831	766	1.084
10	760	721	1.054
11	652	628	1.038
12	580	570	1.017

TABLE 16

Deaths in Bulgaria under one year, 1891 to 1907

AGE IN MONTHS	1891 TO 1902			1905 TO 1907		
	Males	Females	Ratio of male deaths to female deaths	Males	Females	Ratio of male deaths to female deaths
0–1	7,479	5,750	130.0	12,643	9,627	131.3
1–3	4,763	3,975	119.8	6,384	5,378	118.7
3–6	3,479	2,857	121.7	4,680	3,911	119.7
6–9	3,407	2,836	120.8	3,848	3,269	114.3
9–12	1,986	1,760	112.8	2,931	2,716	107.8

due to an actual increase of vitality or efficiency of organization. The causes of the enhanced early death rate are mainly internal instead of external. And it is probably due to this fact that as we pass back to earlier periods of the child's life, when mortality becomes higher, the ratio of male to female deaths becomes higher also. In the first month this ratio is, in fact, uncommonly high, ranging from 125–135 males to 100 females.

Carrying observations of sex mortality back into prenatal life we find the same trend. Not only is the proportion of boys among the dead born exceptionally high, but the earlier the period of development at which death occurs, the higher is the proportion of dead males. Among the human embryos of the Anatomical Institute at Dorpat, Rauber found a sex ratio

TABLE 17

Deaths under one year in Denmark, 1860 to 1879

	1860 to 1864		1865 to 1869		1870 to 1874		1875 to 1879		1860 to 1879
	Male	Female	Male	Female	Male	Female	Male	Female	Ratio of male deaths to female deaths
Under 1 month . . .	7,589	5,708	7,672	5,850	7,583	5,577	8,235	6,197	133.2
1 to 2 months	2,399	1,997	2,343	2,064	2,531	2,137	2,925	2,387	118.6
2 to 3 months	1,514	1,307	1,633	1,452	1,830	1,404	2,049	1,763	118.7
3 to 6 months	3,427	2,798	3,739	2,993	3,877	3,124	4,702	3,788	123.9
6 to 9 months	2,426	1,927	2,475	2,133	2,710	2,209	3,392	2,803	121.5
9 to 12 months . . .	1,948	1,631	1,955	1,842	2,044	1,784	2,336	2,151	112.1
Total one year .	19,303	15,366	19,817	16,334	20,575	16,235	23,639	19,089	

TABLE 18

Sex ratios of dead born in Sweden (1751–1915) (Statistik Årsbok för Sverige, 1919)

YEARS	RATIO OF MALE TO FEMALE DEATHS	SEX RATIO AT BIRTH
1751–1760	135.8	105.1
1761–1770	136.7	105.3
1771–1780	137.6	105.1
1781–1790	141.1	105.4
1791–1800	140.5	105.8
1861–1870	135.3	105.8
1871–1880	131.8	106.0
1881–1890	135.5	106.0
1891–1900	130.2	106.3
1901–1910	128.9	106.5
1911–1915	127.9	106.2

of about 159 to 100. In 3781 abortions reported from Budapest by Körösy (1882–1890) the sex ratio was 152.4. In the same city there were found between 1901 and 1905, 2030 male and 1643 female still births, or a ratio of 123.6 to 100. For the abortions, or foetuses dying before the seventh month, there were reported from 1903–1905, 2481 males and 1586 females, or a sex

ratio of 156.4 to 100. An attempt to class the male and female embryos according to months gave the following results:

	MALE	FEMALE	RATIO
Seventh month	402	348	116
Sixth month	506	437	116
Fifth month	645	396	163
Fourth month	928	405	229

In 2608 abortive deaths reported from Vienna (1893–1899) the sex ratio was 197.9 for legitimate births and 188.2 for the illegitimate. The 6405 abortions recorded in Paris (1886–1890) by Bertillon[1] gave a sex ratio of 131.8, but those from the same city (4391 in number) in 1901 and 1902 gave a sex ratio of 147.9. Compiling data from various sources Prinzing[2] finds for 24,300 abortions a sex ratio of 162.1 to 100. The sex ratio for the Paris abortions for the different months of pregnancy were as follows:

Months	*Sex ratio*
0 to four months	180
Fifth month	118
Sixth month	112

The available evidence indicates that the further back we go in the development of the human embryo, the higher is the proportion of male deaths. The relative proportion of males in early embryos must be quite high because, with a high intrauterine male death rate, the males still preponderate at birth in about the ratio of 105 to 100. Auerbach has discussed what he calls the true sex ratio in man, or the sex ratio among all fertilized eggs, whether they eventuate in abortions, still births or living offspring, and he estimates this ratio at approximately 125 males to 100 females. The ratio becomes more nearly equalized at birth, owing to the high male mortality in utero. The decreasing male mortality during infancy and childhood simply continues the general trend of differential mortality from the earliest period in which reliable records of the sex of dead embryos can be secured. We may say that when we pass to *times* in the lives of human beings when the infant death rate is high, the ratio of male to female deaths becomes *increased*, but when we pass to *places* or peoples in which the infant death rate is high, the ratio of male to female deaths becomes *decreased*.

[1] Annuaire statist-de la ville de Paris, 1896, and l. c. 1901 and 1902.

[2] Handbuch der medizinischen Statistik, Jena, G. Fischer, 1906.

This apparent paradox may be understood, however, if we regard death as, in general, a function of two sets of factors, the internal or constitutional, and the external. The relative potency of these two sets of factors naturally varies greatly under different conditions. In so far as differences of hereditary constitution decide the issue between life and death we have to do with the operation of natural selection. It is quite proper to speak of natural selection as effecting a greater elimination of male than of female infants, because the male sex depends primarily upon an inherent germinal constitution which is different from that of the female. All the facts point to the male as the frailer sex. From the earliest embryos in which distinctions of sex are readily traced, through the precarious period of infancy and even into advanced years, natural selection discriminates against the male. It is only in the child-bearing period, and in some countries not even then, that the death rate of women is, on the average, higher than that of men. To a certain extent in adult life, and to a large extent in the periods of infancy and ante-natal development, the higher mortality of the male is doubtless an expression of his inherent inferiority in constitutional vigor or vitality. In early infancy his vitality is relatively lower than that of the female and only gradually approaches it in later years. The causes of the greater differences in male and female mortality in early infancy are internal and constitutional, and not external or adventitious. The external conditions are practically the same for both male and female infants in early infancy as they are also in prenatal life. What changes with age are chiefly the internal factors. What changes with changes of place are, of course, the external factors. Regarding death as a function of internal and external factors, it is obvious that if the potency of the latter were reduced, the deaths that occur would be, to a larger extent, the expression of internal causes. When non-selective or mildly selective causes of elimination are removed, it is reasonable to suppose that the relative mortality of the two sexes would be more nearly in accordance with their relative degrees of inherent vitality. And as the boys are more frail than the girls, we may understand how a reduction of the infant death rate would cause an increased ratio of male deaths.

The way in which natural selection discriminates between the stronger and weaker sex gives us a clue, I believe, as to how it acts as between the stronger and weaker members of the same sex. With a severe death rate doubtless more of the congenitally weak perish, just as more boys perish than girls under the same conditions. With a mild death rate, a death rate that results from removing, so far as possible, all the external causes of mortality, it is probable that in each sex the death rate is based more strictly on

inherent differences of constitution, as it is in the case of the relative mortality of the two sexes. In relation to natural selection, we may say, then, that what the male is to the female, a congenitally weak infant of either sex is to a congenitally strong one of the same sex. If this is true, as infant mortality increases it eliminates a larger number of weaklings, but it becomes less stringently selective. It takes more of the relatively strong along with the weak. With fewer deaths there is less proportionate loss of the strong, and those who perish, despite the improvements of conditions of life, represent a group with relatively low congenital vigor.

Of course congenital weakness does not always mean hereditary weakness. One great disturbing factor which reduces the correlation between hereditary weakness and congenital weakness is congential syphilis, which is known to be not only a very frequent cause of abortions and still births, but also of deaths in the first year of life. This disease kills off a much higher proportion of males than females during infancy, and as a selective agent it probably has much the same influence on the truly hereditary qualities of the race as the various epidemic diseases of early childhood, only it acts relatively much more than most other diseases during the pre-natal period of the child's life. Were we to succeed in ridding humanity of this scourge, we should doubtless find a *relatively* higher male-female death ratio, and also a change in the average sex ratio at birth in favor of the male sex. It is a curious fact that the removal of causes of death, which carry away more males than females, causes the ratio of male to female deaths to increase rather than to diminish. If we decrease the pre-natal death rate, which we would evidently do through the elimination of syphilis, we would find that relatively[3] more boys would die, and also relatively more of them would be born. Syphilis of course injures all children who contract it, whether they are naturally stong or weak. It therefore introduces much congenital weakness and defect into early life, and increases the death rate from other diseases. But judging from the way it differentiates between the sexes, it probably eliminates infants, to a large extent, on the basis of hereditary vitality. Syphilis depresses the general vigor of the race, but this in no wise proves that it is not a selective agent.

If one goes over the 189 causes of death listed in the volumes of the United States Mortality Statistics, he cannot fail to be impressed with the relatively high male mortality in infancy from practically all causes. Even accidents are more fatal to males than to females. With the single striking exception of whooping cough and the somewhat doubtful exception of gonococcus infection, all of the causes of death which affect infancy take a relatively

[3] In proportion to girls.

high toll of the male sex, and this discriminating death rate continues for most causes of death through several years of childhood. There can scarcely be any other explanation of this than that the male is handicapped by a lessened degree of vitality that is directly or indirectly the result of his peculiar complex of hereditary factors.

In the one disease, whooping cough, which clearly shows a preponderance of female deaths in infancy and childhood, we meet with interesting changes in the sex ratio with increasing age. By combining the data given in the United States Mortality Statistics, covering over 200,000 deaths from this disease, it is shown that in the first year of life when the death rate is unusually high, the ratio of female to male deaths is rather low, 108 females to 100 males. In the next year it suddenly increases (140 females to 100 males) and continues to increase much more slowly until the period of adolescence. Whatever may be the reason why this disease carried off more females than males, the male death rate is relatively higher in the first year than it is later, due in part possibly to the fact that the two sexes differ less in their laryngeal structures at this time, but more, apparently, to the general weakness of the male sex which renders him a relatively easy prey to the various agencies that destroy life.

COMMON LAW MARRIAGE AND ITS DEVELOPMENT IN THE UNITED STATES

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For the purpose of this paper common law marriage may be defined as a marriage which does not depend for its validity upon any license or ceremony but is created by consent of the parties like any other contract.

Today, in one-half of the American states all that is necessary to create the marriage relation is an agreement between the parties to be henceforth husband and wife and the agreement need not be attended with any formality whatsoever. It need not even be in writing. In most states the agreement must be followed by cohabitation, a condition not required by the common law of England. This itself is doubly anomalous. The man and woman must cohabit, that is, live together as husband and wife, before they become husband and wife, and in the face of a provision of the criminal law that persons who cohabit without already being married are guilty of a crime.

According to popular view, common law marriage means simply living in adultery. The man and woman are not referred to as husband and wife merely, but as *common law* husband and *common law* wife. And even lawyers are constantly using these terms. As was said by the Supreme Court of New York: "The term 'common law wife' is not one known to the law, and the law looks with no favor upon the connection indicated by it."[1] But common law *marriage*, the subject of this paper, is as much a marriage as one attended with the utmost solemnity, in those states where common law marriages are recognized. This statement may be well illustrated by reference to a decision of a District Court of the United States in 1918.[2] A man in Minnesota signed a contract of marriage in duplicate and sent both copies to a woman in Missouri. One copy she retained and the other she returned signed to the man in Minnesota. The parties were not in the presence of each other when the agreement was executed and never thereafter lived together. The man was killed on a railroad and the woman brought

[1] In re Brush, 49 N. Y. Supp. 803.

[2] G. N. Ry. v. Johnson, 254 Fed. 683.

suit against the company as widow of the deceased. She recovered. There is ample authority for the statement that the decision would have been the same had the agreement been oral or even made over the telephone. A great number of cases arose during the war where American boys in France married girls in this country by such an exchange of consent.[3]

Having seen that a common law marriage is simply a marriage entered into without formality, and when entered into is not different in legal effect from the most formal marriage, let us consider briefly the history of the subject and its development in the United States.

Prior to the Council of Trent (1563) all that was necessary to the validity of a marriage was the consent of the parties. It must not be understood, however, that at that time marriages were for the most part non-ceremonial. Following the teachings of St. Paul, the Christian Church from an early date numbered marriage among the sacraments. Tertullian, writing in the second century says marriage not performed in the church (*occulate conjunctiones*) is considered almost as bad as fornication and Pollock and Maitland say that during Bracton's time in England all decent persons go to church to be married. But down to the Council of Trent the canons on marriage were merely directory and a marriage although irregular and clandestine was valid if proved to have been entered into *per verba de praesenti*. The parties might be compelled by spiritual censures to celebrate their marriage in church but they were married already when they exchanged consent. Prior to the eleventh century the agreement of marriage had to be followed by carnal intercourse, but due to ecclesiastical hair-splitting in the eleventh century two distinctions came to the front, marriage *sponsalia per verba de praesenti*, that is, marriage by mere consenting words couched in the present tense, and marriage *per verba de futuro cum copula*, that is, marriage by agreement to marry in the future followed by carnal intercourse. The theory of the latter was that the copula gave effect to the previous promise of marriage. The man responsible for these distinctions was Peter Lombard, an ecclesiastic at the University of Paris. His theory was that marriage is a sacrament and the sacrament is in the consent and when this consent takes place the sacrament of marriage takes place. The legist Vacarius and other canon law lawyers who believed in the canon law as formulated by Gratian objected, but they could not prevail. Lombard's theory was accepted by the Church. No wonder Pollock and Maitland say it is a victory of Parisian theology over Bolognese Jurisprudence[4]

[3] Common Law Marriage and Its Development in the United States, Otto E. Koegel, American University, 1921.

[4] History of English Law II, 368.

or that Howard says it represents a triumph of Gallic theology over the doctrine of Gratian, as maintained by the Italian jurists.[5] These distinctions, however, came to stay and the books and decisions today abound with references to them, not always accurate.

While there is much dicta to be found in the reports to the effect that marriage *per verba de futuro cum copula* is valid in the United States no case has been found where there is a decision on the question. Where the question has been necessary to the decision the courts have uniformly held that marriage cannot be contracted in this form. And many courts, following Bishop's statement in his great work on Marriage, Divorce and Separation, state that the doctrine created merely a presumption of marriage which could be overcome by showing that the parties did not intend the copula to convert the previous promise into marriage. There is also some dicta in the later English decisions to the same effect, although not all of the later English judges are of that opinion. Certainly by the canon law and by early English law the copula, in the marriage *per verba de futuro cum copula*, created a presumption which did not admit of contrary proof. It is so stated by such eminent legal historians as Reeve, Pollock and Maitland, and by Professor Esmein of the University of Paris in his Le Mariage En Droit Canonique, the *magnum opus* on the subject. Bishop may have altered his statement had he written after Pollock and Maitland or Esmein.

By the twenty-fourth session of the Council of Trent, November 11, 1563, the validity of marriage was made to depend on its being celebrated in the presence of a priest and witnesses. The decrees of the Council were at once accepted in all Catholic countries, and before the seventeenth century, had been accepted in all the countries on the continent. No attempt was made, however, to introduce the decrees into England. Pius IV did request Mary, queen of Scots, to publish them in Scotland but the Reformation was on and she dared not do it. It is safe to say that in almost every country in the world with the exception of Great Britain and the United States, common law marriages, as we call them, have not been recognized since the sixteenth century, and they have not been valid in England since 1753.

By Lord Hardwicke's Act passed in 1753 common law marriages were abolished in England.[6] The Act was in a large measure designed to check the great number of clandestine marriages celebrated by disreputable Fleet persons without publication of banns. The act proved entirely too

[5] History of Matrimonial Institutions, I, 336.

[6] 26 Geo. II c. 35, Vol. VII, Great Brit. Stat. at Large 525 (London 1769).

harsh, however, making publication of banns and a ceremony in the Established church essential to the validity of a marriage. Ministers violating the act were to be transported to one of his Majesty's plantations in America for the space of fourteen years according to the laws in force for the transportation of felons. Persons forging a marriage registry were to suffer death. The Act was conceived in a spirit of bigoted intolerance toward all dissenters save only Quakers and Jews.

As the Act of 1753 did not apply to Scotland and places beyond the seas, it gave rise to the Gretna Green marriages, so called from a town just across the border in Scotland where many English couples went to be married without license or banns. The "ceremony" was performed by the blacksmith or some other person and the parties immediately returned to England where the marriage was valid on the principle that a marriage valid where celebrated is valid everywhere. It became necessary to amend the Hardwicke Act and after numerous attempts the Civil Marriage Act of 1836 was passed, which with a few later modifications is the law today.

Although common law marriages were abolished in England in 1753, three celebrated decisions were rendered on the subject by English courts in the nineteenth century on cases appealed from Scotland and Ireland. In the Dalrymple case[7] decided in 1809, Lord Stowell, in an opinion which, including exhibits, occupies 249 pages in the report, held that all that was necessary to a valid marriage by the common law of England was an agreement *per verba de praesenti* or *per verba de futuro cum copula*. In 1844, in Regina v. Millis,[8] a case on appeal from Ireland, in an opinion which takes up 373 pages in the reports, the House of Lords held that by the common law of England a religious ceremony was always necessary to the validity of a marriage. All competent scholars agree that this decision is historically unsound. Pollock and Maitland have conclusively shown that a religious ceremony was not essential to the validity of a marriage by the English common law.[9] But a marriage without ceremony under the early English law was invalid for possessory purposes. The children of such unions did not inherit English soil and the widow took no dower, as she was not endowed at the door of the Church, *dos ad ostium ecclesiae*.[10] Failure to observe these distinctions led the House of Lords astray.

In 1861 the House of Lords in the Beamish case[11] followed the rule laid

[7] Dalrymple v. Dalrymple, 2 Hagg. Const. 54.

[8] 10 Clark and Finley 534–907.

[9] History of English Law II, marriage; Pollock, First Book of Juris. 328.

[10] Ibid.

[11] Beamish v. Beamish, 9 H. L. Cas. 274.

down in Regina v. Millis that informal marriages were never valid in England although they were convinced that the decision in Regina v. Millis was incorrect. This was because of the principle that the House of Lords is irrevocably bound by its own decisions, a principle which has never maintained in the United States.

As the English common law stands today in England, informal marriages were never valid.[12] As the common law in one-half of the American states stands today, informal marriages are valid and there are no such disadvantages as the widow not taking dower and the children not inheriting.

Informal marriages were not favored in the American colonies. By the laws of some of the colonies they were expressly declared void. Time will not permit a lengthy discussion of the question, but it has been shown elsewhere that common law marriages were contrary to the policy if not the laws of all the colonies.[13]

We have seen that common law marriages were abolished in continental countries in 1563, in England a quarter of a century before the American Revolution, and were either illegal or contrary to the policy of all the American colonies. The question then arises, why are they valid today in one of half the American states? Are we to find some early but well considered decisions of the courts of this country establishing the doctrine? Let us see.

The earliest case reported in this country where the question is decided is the case of Mangue v. Mangue decided by the Supreme Court of Massachusetts in 1804.[14] Plaintiff asked for a divorce on the ground of adultery and offered in proof of marriage a certificate of a justice of the peace that the parties went through an informal marriage ceremony in his presence, each taking the other by the hand and reciting that they were henceforth husband and wife. The court held there was no marriage and refused the divorce on the ground that there was no marriage to dissolve.

The next case reported is Fenton v. Reed, decided by Chancellor Kent of New York in 1809.[15] Although not at all necessary to the decision in this case Chancellor Kent said that "a contract of marriage *per verba de praesenti* amounts to an actual marriage and is as valid as if made *in facie ecclesiae*." His opinion is but one-half page in length. There is no mention of the earlier Massachusetts case or of the colonial laws. In fact the decision does not even show Chancellor Kent wrote it but we know he did.

[12] Law Times (London), Oct. 24, 1896.
[13] Koegel, Common Law Marriage, Chapter V.
[14] 1 Mass. 240.
[15] 4 Johns. (N. Y.) 52.

In 1810 the Supreme Court of Massachusetts considered the subject and again held common law marriages not valid in that state.[16] This decision has been followed by a few of the New England states and is the law there today.

In 1814 the Pennsylvania court laid down a rule similar to that by Chancellor Kent, and in a case where it was held the words did not constitute a common law marriage.[17] Many courts had upheld common law marriage in cases less meritorious and the advocates of common law marriage should get little inspiration from this early Pennsylvania case, yet it is always cited as authority. In 1820 the New Hampshire court approved the common law doctrine, although entirely unnecessary to the decision.[18] In 1849 the same court found occasion to disregard the dictum made in 1820.[19] In 1821 the rule was approved in Kentucky but a dissenting opinion in the case shows more care and research.[20] This was not to remain the law in Kentucky, however, as the legislature in 1851 rendered such marriages void. In 1827 Chancellor Kent published Vol. II of his commentaries and states the rule as he did in the case he decided in 1809. The only American authority cited by him is his own decision. In 1829 the Vermont court approved the rule in a dictum[21] but the same court subsequently repudiated the early decision, saying "the loose doctrine of the common law in relation to marriage was never in force in this state."[22] In 1829 the New Jersey court in a dictum approved the doctrine. The decision, like many others we have been discussing, is remarkable for the lack of learning displayed.[23] South Carolina adopted the rule in 1832.[24] In 1842 Greenleaf affirms the doctrine in his work on evidence and there is hardly a case decided on the question during the next half century that does not cite him as authority. Greenleaf cites only Kent and Kent's decision of 1809.

In 1843 the question came before the Supreme Court of the United States but that court was evenly divided and could give no decision.[25] Thus the doctrine was not so thoroughly recognized in this country at that late day that the highest court of the land was willing to accept it. In 1852

[16] Milford v. Worcester, 7 Mass. 48.
[17] Hantz v. Sealey, 6 Binn. (Pa.) 405.
[18] Londonderry v. Chester, 2 N. H. 268.
[19] Dunbarton v. Franklin, 19 N. H. 257.
[20] Dumaresly v. Fishly, 10 Ky. 368.
[21] Newbury v. Brunswick, 2 Vt. 151.
[22] Morrill v. Palmer, 68 Vt. 1.
[23] Pearson v. Howey, 6 Halstead (N. J.) 15.
[24] Fryer v. Fryer, Rich. Eq. Cases 85; also Jewell v. Magood, ibid. 113.
[25] Jewell v. Jewell, 1 How. (U. S.) 219.

California affirmed the rule without any citation of authority whatever, although it was not necessary to the decision in the case.[26] The legislature, however, subsequently removed all doubt by declaring such marriages void. Mississippi accepted the doctrine in 1856;[27] Georgia in 1860;[28] Ohio in 1861;[29] Alabama in 1869;[30] Illinois in 1873;[31] Michigan in 1875;[32] Iowa in 1876;[33] Missouri in 1877;[34] and Minnesota in 1877.[35] In 1878 the Supreme Court of the United States accepted the doctrine in a very brief opinion and Justice Strong made a number of errors.[36] In fact he says in effect that he has not made a careful investigation. He even argues that it may well be doubted whether common law marriages are invalid in Massachusetts, citing in support of his statement a case[37] decided a few years after Chief Justice Shaw's decision in 1810, ignoring entirely a decision by the Supreme Court of Massachusetts, rendered just four years previously, in which the decision of 1810 is unequivocally approved.[38] The question again arose in Massachusetts the year following the decision of the Supreme Court of the United States, and the Massachusetts court took occasion to set the Supreme Court right in the matter.[39]

The doctrine of the common law marriage has no place in American law. The doctrine developed gradually in this country, after it had been thrown overboard everywhere else, by reason of poorly considered decisions blindly following precedents which themselves bear no evidence of any consideration at all. It could have and should have been rejected as many other principles of English law were rejected as inapplicable to our institutions and government. The principle of the common law marriage is not such a sacred principle of jurisprudence that it needs a positive legislative declaration to render it inoperative. The Supreme Court of Massachusetts very wisely held that any legislation on the subject of marriage supersedes entirely the common law but it could have gone farther than that. In June of this

[26] Graham v. Bennett, 2 Calif. 503.
[27] Hargroves v. Thompson, 31 Miss. 211.
[28] Askew v. Dupree, 30 Ga. 173.
[29] Carmichael v. State, 12 Ohio St. 553.
[30] Campbell's Admr. v. Gullatt, 43 Ala. 57.
[31] Port v. Port, 70 Ill. 484.
[32] Hutchins v. Kimmell, 31 Mich. 126.
[33] Blanchard v. Lambert, 43 Iowa 231.
[34] Dyer v. Brannock, 66 Mo. 391.
[35] State v. Worthingham, 23 Minn. 528.
[36] Meister v. Moore, 96 U. S. 826 (1878).
[37] Parton v. Hervey, 1 Gray (Mass.) 119.
[38] Thompson v. Thompson, 114 Mass. 566 (1874).
[39] Commonwealth v. Munson, 127 Mass. 459 (1879).

year, the Supreme Court of Delaware did go farther. That court gave judicial sanction to the contention made in this paper, that the common law marriage has no place in American law; that it is contrary to our history, repugnant to our institutions and should have been rejected everywhere.[40]

It seems never to have occurred to the courts of this country that we have in effect discarded both common law rules and adopted an entirely spurious one instead. The doctrine *per verba de futuro cum copula* has been rejected everywhere. In less than half a dozen states has the rule *per verba de praesenti*, without cohabitation, been expressly recognized. The doctrine actually in force in some twenty states is not that of the common law nor that of the canon law as it existed prior to the eleventh century when the Lombardian distinctions were accepted by the Church. Before these distinctions were adopted the espousals *per verba de praesenti* had to be followed by carnal intercourse, not cohabitation. Cohabit has a technical meaning. All courts hold it does not mean carnal intercourse. It means dwelling together after the manner of husband and wife. It is a maxim of the English law that *consensus non concubitas facit matrimonium.* A doctrine that requires two persons to be guilty of fornication a number of times before a legal status is created is anomalous to say the least. Yet this is exactly what is required in a number of American states. Again, where will the line be drawn? When do the parties cease to be fornicators, and just when does the sublime institution of matrimony begin? What about the legal presumption that intercourse illicit in its inception will be presumed to continue to be illicit? These and many other questions confront one upon investigation of this subject.

The state of the law on this subject is much confused. Very slight evidence of an intent to change the *status personarum* is required. The Supreme Court of Alabama has said that it is not necessary that the parties believe themselves "married in the eyes of the law,"[41] and they do not. Lord Stowell said they may doubt the validity of their marriage,[42] and most of them do. Lord Stowell also said that secrecy is perfectly consistent with an informal marriage.[43]

During the world war there was within the organization of the Bureau of War Risk Insurance the largest court of domestic relations in the world. The enlisted men in the military and naval service were compelled to support their families while in service unless granted exemption for good cause

[40] Wilmington Trust Co. v. Hendrixson, 114 Atl. 215.
[41] Tartt v. Negus, 127 Ala. 301.
[42] Dalrymple v. Dalrymple, 2 Hagg. Const. 76.
[43] Ibid.

shown. More than 110,000 men claimed exemption from supporting their wives and children. Out of this number were many hundreds of alleged common law marriages. A great many cases of alleged common law marriages were also presented under the insurance and compensation features of the War Risk Insurance Act. There is no doubt that the War Risk Insurance Bureau considered more cases of alleged common law marriage, yes, many times over, than are contained in all the reports of adjudicated cases put together. I am in a position to say that most of these alleged marriages are but meretricious relationships, for the convenience of the parties alone, and in a large percentage of the cases the reason no formal celebration of the marriage was had is because one or the other, and in many cases both, of the parties were already married but not divorced from a former spouse. There is nearly always a ghost in the closet. Moreover, very few, if any, of these persons really believe they are married. If we adopt as a *sine qua non* to the validity of these marriages the belief of the parties that a divorce is necessary to dissolve the relationship (and it is necessary), then there are no common law marriages. We have already seen, however, that they need not believe themselves married "in the eyes of the law." And few if any of these persons believe their children are legitimate. In fact, nearly all believe that "common law marriage" and "living in adultery" are synonymous terms. And if the New York court was correct in its definition of "common law wife," most lawyers believe the same, as lawyers invariably designate these persons as common law husband and common law wife.

The usual argument advanced in favor of these unions is that they render the children legitmate. This was the brief argument of the Supreme Court in 1878. But the fact is overlooked that a great number of these unions are not and were not intended to be permanent. The parties just "quit" as they call it, and then go through a marriage cermony with someone else. If the first union is held a marriage in order to legitimate the children, the children of the subsequent formal union must be bastardized.

Common law marriages are valid today in but one-half of our states and territories. The legislature of Missouri in March, 1921, declared them void, influenced somewhat no doubt by the decision of the Federal Court in Missouri in 1918. The bill was introduced at the instance of the Children's Code Commission which evidently did not believe that the interest of children are protected to any great extent by these informal unions. The American Bar Association and practically every writer on the subject of marriage has condemned the common law marriage. One says "no doubt our common law marriage is thoroughly bad, involving social evils of the

most dangerous character * * * * and practically all the hardship and social anarchy of the canon law at its wickedest survives in our common law, * * * * a custom which legalizes and virtually invites impure and secret unions."[44] Another asks "is it not an amazing fact that, in a matter which so profoundly affects the dignity and stability of the family institution, society should be so slow to take enlightened action?"[45] And an eminent Scotch lawyer has said "the law makes clear and full provisions for contracts affecting the sale of houses and lands, horses and dogs, and goods and chattels of every description; and why marriage, the most important of all human contracts should not be as anxiously defined and provided for and thus placed beyond the reach of both fraud and doubt appears to me to be one of the greatest anomalies in the law of a Christian country."[46] It is a fact that even the English judges who decided in favor of the validity of common law marriages in the nineteenth century disapproved of them. Lord Campbell says "I have always been of opinion that to constitute this, the most important of all contracts on which society itself depends, there ought to be a public form of celebration to which no reasonable person can object, admitting by means of registration, of easy, certain and perpetual proof; the addition of a religious ceremony being highly desirable, although not absolutely necessary."[47] And Lord Stowell says "in most civilized countries, acting under a sense of the force of sacred obligations, it (marriage) has had the sanction of religion superadded."[48]

The report of your committee on hereditary defectives states "that without prohibition of common law marriages, the chances would be that when a couple, one or both of whom were defectives, wished to marry, they would do so forthwith if permitted, or they would go to some state where common law marriages are valid, simply declare themselves married, and snap their fingers at law in any form." It is imperatively necessary, therefore, that this Congress use its influence to abolish common law marriages in the United States. An exception should be made, however, where cohabitation continues after the removal of an impediment to a valid ceremonial marriage. With the exception of Massachusetts, Iowa and Alaska, the legislatures of all the states where common-law marriages have been invalidated have failed to recognize this exception and unnecessary injustice has resulted in a great number of cases.

[44] Howard, History Matrimonial Institutions III, 171.
[45] Goodsell, The Family as a Social and Educational Institution, 537.
[46] Cook, Vol. 61 Atlantic Monthly 249.
[47] Beamish v. Beamish, 9 H. L. Cas. 338.
[48] Dalrymple v. Dalrymple, 2 Hagg. Const. 64.

The following table shows the present state of the law on the subject in the United States:

STATE	PER VERBA DE PRAESENTI WITHOUT COHABITATION	PER VERBA DE PRAESENTI FOLLOWED BY COHABITATION	PER VERBA DE FUTURO CUM COPULA	PRESUMPTION OF, FROM COHABITATION AFTER REMOVAL OF IMPEDIMENT
Alabama	Invalid (c)	Valid (c)	Invalid (c)	Yes (c)
Alaska	Invalid (s)	Invalid (s)	Invalid (s)	Yes (s)
Arizona	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
Arkansas	Invalid (c)	Invalid (c)	Invalid (c)	No (c)
California	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
Colorado	Invalid (c)	Valid (c)	Invalid (c)	Yes
Connecticut	Invalid (c)	Invalid (c)	Invalid (c)	No (c)
Delaware	Invalid (c)	Invalid (c)	Invalid (c)	No (c)
District of Columbia	Doubtful (n)	Doubtful (n)	Invalid (n)	Doubtful (n)
Florida	Doubtful (n)	Valid (c)	Invalid (n)	Yes (n)
Georgia	Doubtful (c)	Valid (c)	Doubtful (c)	Yes (c)
Hawaii	Invalid (n)	Valid (c)	Invalid (n)	Yes (n)
Idaho	Invalid (s)	Valid (s)	Invalid (s)	Yes (c)
Illinois	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
Indiana	Doubtful (n)	Valid (c)	Invalid (n)	Yes (c)
Iowa	Invalid (n)	Valid (c)	Invalid (n)	Yes (s)
Kansas	Doubtful (n)	Valid (c)	Invalid (n)	Yes (c)
Kentucky	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
Louisiana	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
Maine	Invalid (n)	Invalid (n)	Invalid (n)	No (n)
Maryland	Invalid (c)	Invalid (c)	Invalid (c)	No (c)
Massachusetts	Invalid (c)	Invalid (c)	Invalid (c)	No (c)
Michigan	Invalid (c)	Valid (c)	Invalid (c)	Yes (c)
Minnesota	Valid (c)	Valid (c)	Doubtful (n)	Yes (c)
Mississippi	Valid (s)	Valid (s)	Doubtful (n)	Yes (n)
Missouri	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
Montana	Invalid (s)	Valid (s)	Invalid (s)	Yes (n)
Nebraska	Doubtful (c)	Valid (c)	Doubtful (c)	Yes (c)
Nevada	Doubtful (n)	Valid (c)	Invalid (n)	Yes (c)
New Hampshire	Invalid (c)	Invalid (c)	Invalid (c)	No (c)
New Jersey	Doubtful (n)	Valid (c)	Invalid (n)	Yes (c)
New Mexico	Doubtful (n)	Valid (n)	Invalid (n)	Yes (n)
New York	Valid (c)	Valid (c)	Invalid (c)	Yes (c)
North Carolina	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
North Dakota	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
Ohio	Doubtful (n)	Valid (c)	Invalid (n)	Yes (c)
Oklahoma	Doubtful (n)	Valid (c)	Invalid (n)	Doubtful (c)
Oregon	Doubtful (c)	Valid (n)	Invalid (n)	Doubtful (n)
Pennsylvania	Doubtful (c)	Valid (c)	Invalid (c)	Yes (c)
Philippine Is	Invalid (s)	Invalid (s)	Invalid (s)	No (s)

STATE	PER VERBA DE PRAESENTI WITHOUT COHABITATION	PER VERBA DE PRAESENTI FOLLOWED BY COHABITATION	PER VERBA DE FUTURO CUM COPULA	PRESUMPTION OF, FROM COHABITATION AFTER REMOVAL OF IMPEDIMENT
Porto Rico	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
Rhode Island	Doubtful (n)	Valid (n)	Doubtful (c)	Doubtful (n)
South Carolina	Doubtful (c)	Valid (c)	Doubtful (c)	Yes (c)
South Dakota	Invalid (s)	Valid (s)	Invalid (s)	Doubtful (n)
Tennessee	Invalid (c)	Invalid (c)	Invalid (c)	No (c)
Texas	Invalid (c)	Valid (c)	Invalid (c)	Yes (c)
Utah	Invalid (s)	Invalid (s)	Invalid (s)	No (c)
Vermont	Invalid (c)	Invalid (c)	Invalid (c)	No (c)
Virginia	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
Washington	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
West Virginia	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
Wisconsin	Invalid (s)	Invalid (s)	Invalid (s)	No (s)
Wyoming	Doubtful (n)	Valid (n)	Invalid (n)	Yes (n)

(c) By court decision. (s) By Statute. (n) No decision on the question.

THE HINDU IDEAL OF MARRIAGE

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GENERAL CONSIDERATIONS

Vivah (marriage) is a sacred thing for a Hindu, and no less to a Mohammedan. It is a part of his *Dharma*, wrongly translated as religion. Dharma stands for a harmonious development of one's physical, mental, moral and spiritual faculties. What Culture is to an Englishman, and Kultur to a German, Dharma is to a Hindu.

The chief object of marriage is the production of noble offspring. The pleasures of the flesh are incidental and secondary. The vast majority of Indians subscribe to this view, even sometimes to an unintelligent extreme. Unfortunately, there is a tendency, with growing materialism, to consider sensual gratification as the essential part of marriage.

Marriage is the root of life, the fundamental basis of world, and the most important event in one's life. Married life is natural. Old maids and bachelors represent an abnormal condition of society.

Monogamy represents the natural order of things. Forced continence and Shakerism on the one hand, and Oneida Communism and Free Love on the other, are extremes which deserve little support. Polygamy is worse than monogamy but, at all events, it is better than promiscuous intercourse, if other conditions render it unavoidable.

Swyamvara is an ideal, rather difficult in the present condition of society but quite practicable. Essentially it consists of a deliberate choice, more or less self-made, of mate on the part of a marriageable youth and a girl. Literally, it means "Self-Selection." The youth and the girl chant Vedic verses (mantras) and make a declaration in the presence of sacred fire, relatives, friends and learned men, in some such terms as these: (1) I make a conscious and deliberate vow in the full possession of my senses. (2) My object in marrying is the production of noble offspring. (3) My union with my mate shall be life-long, till death of one or both separate us. (4) I shall remain the partner in life only of the one before me and no other, come what may. (5) I will deal with my partner on a perfectly equal status

and consider him or her as a personification of my happiness. (6) I make this eternal vow in presence of God and man.

The youth leads and the girl follows in uttering these verses. There are a number of accompanying ceremonies and sometimes conditions are laid down to decide the prowess or any other quality of a mate.

The Swyamvara of Sita and Rama as mentioned in Ramayana is a well-known and the noblest example. Some people, however,—and their number is not very large—consider the event to be mythological.

PRINCIPLES OF MATE SELECTION

The dominating principle should be a balance of qualities, actions and temperaments of the man and the maid. In Sanskrit they are known as Gun, Karm, Sabhav.

1. *Distant families.* The families of the youth and the girl should not be nearly related. Mann, the famous Hindu Law-giver, says: "A youth should marry a girl, not belonging to the family of his father and not related to his mother, at least up to six generations" (vide Manusmriti 111, 5). It is a commonplace fact we do not love or value a thing that we are familiar with, so much as one hidden from our view. Nearly related husband and wife know each others failings and follies, faults and imperfections, ebullitions of temper and misbehavior, and often have little respect for each other. There is little or no mingling of new and useful characters, varying fluids and essences, and no interchange of elements. Hence no improvement of race. Nearly related families offer more occasion for family disputes and multiplication of sorrows, than distantly related families. In distant relationship there is often a gain of new influences and privileges.

2. *Distant places.* Far-off marriages are advantageous. A distance of 500 miles is not much. In Sanskrit a "daughter" is called "duhitri" (from Du—distant, Hit—good) because the marriage of a girl to a man coming from a far off place is productive of good. If the bride's parents or relations live near, she will often visit them. According to Hindu traditions they have to make presents to her every time she pays a visit. That means a burden to them. Again, her affections will be divided. Further, she will seek parental support in petty home quarrels.

3. *Proper age.* Maharishi Dyanand Saraswate, the Founder of Aryasmaj, suggests the following table:

NUMBER	AGE OF GIRL	AGE OF YOUTH
	years	*years*
1	16	25
2	17	30
3	18	36
4	19	38
5	20	40
6	21	42
7	22	43
8	24	48

Again, the great Hindu surgeon, Dhanwantri, forbids sexual connection between persons who are under the aforesaid ages:

If a girl under sixteen conceives of a man under twenty years, she very often miscarries, but if she does not miscarry and the child is born in full time, it does not live long, but if it does live long, it is nothing but a weakling; never should, therefore, a man have sexual intercourse with a girl of a very tender age.

4. The youth and boy should be of equal status or position. A prudent man should not marry a girl of unknown father or having no brother (Manu 111, 11).

5. *Qualities* should be attended to. Let a youth avoid the following families, be they ever so rich in kine, horses, sheep, grain, or other property: (1) one which is not religious and neglects the sacred rites; (2) in which there are no men of character; (3) in which the *Veda* is not studied; (4) the members of which have long and thick hair on their body; (5) those which are subject to hemorrhoids; (6) phthisis; (7) weakness of digestion; (8) epilepsy; (9) and (10) white and black leprosy.

A maid with reddish hair, redundant member, sickly, too much or no hair, garrulous or having red eyes, should not be married. A girl, named after a constellation, a tree or a river, bearing the name of a low caste or of a mountain, a bird, a snake, or a slave, or a terror-inspiring name, should not be married. A girl, free from bodily defects, having an agreeable name, the graceful gait of a Hamsa (swan) or a female elephant, a moderate quantity of hair on the body and the head, small teeth and soft limbs, should be married (Mana 111, 6–10).

Such marriages will lead to everlasting happiness.

(1) MANN: Manusmriti, the Law of Mann (Sacred Books of the East Series edited by F. Mann Muller).
(2) MAHRISHI DAYANAND: Satyarthprakash (English translation of Light of Truth, available from Aryasmaj, Lahore).
(3) MAHRISHI DAYANAND: Sanskarvidhi (Hindu).
(4) Vaidik Vivahadrisba (Hindu book).

THE CONTROL OF PARENTHOOD IN RELATION TO EUGENICS

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It is a great privilege to bring to you a few questions relative to control of parenthood, whose answers will be of tremendous value to social science. May I say that I am bringing them merely as one interested in social science—that of the printed page and of human nature. I must not be understood as speaking for the profession of social service, as I believe that its personnel would be compelled to differ—at least publicly—from a few things that I shall wish to say.

It may seem in a measure dogmatic to arrange these problems under the headings of positive and negative eugenics, but for brevity and clarity, may we observe this somewhat arbitrary division?

POSITIVE EUGENICS

Under positive eugenics, we shall consider racially fit individuals, with high standards of life, high evaluation of family relationships, and an appreciation of economic obstacles to realizing them.

1. Have we ascertained the proportion of such individuals who remain celibate because economic conditions do not justify assumption of family responsibilities based upon an uncontrolled parenthood? Theirs apparently is the choice between celibacy and a parenthood which they are not permitted to control. Amidst economic stress and uncertainty they choose the former, and can we censure them?

2. If there are such, would the power of self-determination of parenthood help to remove the barrier to marriage and eventual parenthood? If individuals of this class were permitted to exercise their judgment in this, as in infinitely lesser realms, would a considerable number be happy to assume parenthood?

3. If there are such, would this fact tend to increase the number of family units among the racially desirable, and bring greater numbers within the sphere of potential parenthood?

4. If this is true, does it seem that the power of control of parenthood by control of conception is of interest to eugenists as one promising possible solution of this problem?

NEGATIVE EUGENICS

Under negative eugenics we shall include among the racially less desirable, only those who possess sufficient intelligence and control to render them responsible individuals. The irresponsible, it is obvious, must be excluded from our consideration, and their reproduction subjected to social control.

Is it not true that eugenists have hoped to preclude disgenic parenthood by directing their interdict against marriage? And that they have attempted to prevent the former by enjoining the latter? I refer to the racial conscience which we hope to build up among responsible individuals. Now we may ask ourselves this question: *What proportion of the racially disgenic individuals conform to this racial standard, and what are the results of conformity and non-conformity?*

First, there are those who conform and do not enter upon marriage. Men of this group decide to live celibate, and it is only fair to them to suppose—intend to live continent. But they find the world as lonely as it is populous, and as many disappointments as there are expectations, and gray life in drab furnished rooms becomes intolerable. Stress of effort, strain of disappointment, and resistance to the great drive in human nature are sometimes too much, and the hope to live continent fails of realization.

If this is true, does it seem that a possible aftermath of conformity to our advice may be promiscuity of sex-relationships? And may this be equally true of the racially desirable individuals whom we mentioned under the subject of Positive Eugenics, who remain unmarried for the reasons that we discussed? Can race and promiscuity profit at the same time,—especially that factor of promiscuity which we term prostitution?

And if we pass to the further problem of illegitimacy, shall we be compelled to confess that at times our purpose suffers additional defeat? Parenthood through marriage we have discouraged, and to some extent—we do not know how great the extent,—parenthood independent of marriage occurs and defeats what looked at first like victory. And to the disaster of disgenic heredity, which we sought to prevent, is added the tragedy of illegitimacy.

Second, there are those who enter upon marriage, notwithstanding our hope that racial conscience would prevail. The disgenic factor may be tuberculosis, psychopathic or neuropathic instability, some higher and less obvious form of mental deficiency, venereal infection, or some one of many other transmissible defects. How can this family be prevented from becoming a racial menace?

1. Shall it be dissolved? Perhaps it is a union founded upon rare fineness of interest, where there is present every element for the better association

of two responsible individuals. Society would indeed hestitate to disrupt such a family, and is it not possible that society would have much to lose by such disruption?

2. Shall absolute continence be imposed, if so, how, and with what results?

3. Shall parenthood be risked by a chance that amounts to negative compulsion? or

4. Shall there be made possible to the members of this union immunity from disgenic parenthood. through control of conception by information which we know exists today?

These are the phases of the problem of birth control, as it relates to the individual family. But what of the field of social relationship at large? From the well-known Studies in Infant and Maternal Mortality by the Children's Bureau, the Report and Evidence of the National Birth-Rate Commission of Great Britian, the statistical publications of organizations conversant with nation and statewide problems of social pathology, and the case records of innumerable social service agencies of the country, we see something of the panorama of tragedy in society at large.

Is it true that we have defective children doomed to defect from the moment of conception? Dependent and delinquent children and adults strongly predisposed to pathologic careers not by environment alone, but by congenital defect that becomes effective by heredity or transmission in one of the other possible channels? Children conceived of parents suffering from tuberculosis, psychopathic and neuropathic instability, some higher form of mental defect, or venereal disease, when we are more certain than uncertain that in many cases these defects are transmissible? Children that continue to be born against the judgment and the will of parents, only to augment the problem of relief and increase the number of persons already destined to the humiliation of dependency upon the patronage of others? And is it true that many of these children will pay for their intrusion the penalty of early labor?

Is it true that women, many times mothers in the midst of squalor, are seeking the knowledge by which they may cease to burden themselves and society, and impair the race? That, upon being refused this knowledge, by those professions to whom they look for advice in other matters, they resort to such modes of self-help as only frenzied minds can conjure up? Is it true that entire neighborhoods of mothers succumb to horrible remedy because prevention is denied to them? And all this, in an age of the glorification of Motherhood, and the existence of knowledge,—we may be permitted to assume—sufficiently ethical, aesthetic and physically non-injurious to receive the approval of the most exacting classes of our society today!

Can it be that the menace of extending information is greater than the menace of withholding it? Is it physically possible that the danger from abuse of knowledge can exceed the danger from abuse of ignorance?

Are these not the conditions among enlightened peoples after race-long attempts at relief and decades of modern preventive effort for social welfare? Excellent, searching, and systematic as our social work has become, does it sometimes seem to us that our progress lies not so much in the solution of our problems, as in the elaboration of more magnificent machinery for their perpetuation upon a constantly increasing scale? And still is it not true that the human nature with which we deal today with imperfect understanding is much the same that it has ever been? For after all, has it not remained remarkably unchanging?

Is it possible that we have omitted from our plan of action some vitally important factor of solution? If we seem to possess too much reason to be purely instinctive, and too much instinct to be purely rational, can we not harmonize these endowments, and do so openly, honestly and healthfully? Have we made available to mankind every power at his command for self-rehabilitation? Is it possible that the power to regulate parenthood through control of conception is one great resource upon which we have not yet drawn in our programs for social welfare?

What is the social and racial value of birth-control? We ask this question in a scientific and impartial spirit. To whom may we turn for a scientific and impartial answer?

First, may we turn to the Profession of Medicine? Is it not, by force of circumstances, an eminently conservative body? Perhaps this is due to the suppression which it has experienced from the days of the seventeenth century, when it was compelled to conform to the censorship of church and state. And just as it accepted three centuries ago the limitations imposed upon it by the dogma of a distorted Aristotle, does it not consent today, with remarkable loyalty, to the legal restrictions initiated by a somewhat less notable authority, who did not have the distinction of possessing all the knowledge of this time? When our federal and state laws confer upon the Medical Profession the necessary freedom to develop the vital subjects of sex science and the practice of obstetrics, may we not confidently trust it to measure up to the excellent progress it has made in other fields where it has been free from legal limitation?

Second, may we turn to the Profession of Social Service? Or is this also, by force of circumstances, an unfree body? Is it true that public charities are sometimes dominated directly by partisan motives and considerations of tenure that tender scientific initiative extremely hazardous and unwel-

come? And ultimately, by an electorate whose chief recommendation is not its social wisdom? And is it true that private charities depend for their very life upon approval of subscribers, and that all plans of action must proceed with circumspection?

Does it seem, then, that the two great professions most intimately serving human nature are among the most unfree in helping it to answer a fundamental question? And does it seem that in comparison with these professions, eugenists are relatively free from the barriers of tradition and the menace of partisan and personal prejudice? And with this rare freedom, what more magnificent field lies before you for scientific development and impartial conclusion?

Is it not true that social science must be measured in terms of the future, and that all plans of action must be guided by the principles of eugenics? And just as eugenics is the foundation of social science, may it be true that birth control is one of the principles at the foundation of eugenics?

If there are those among us who discover in ourselves from any motive a cringing circumspection, which commends itself to us by any name of less contempt, let us eradicate it at once, or cease to impede and discredit the work of scientific endeavor. Fear and the scientific spirit cannot exist together. Servility and honor are incompatible.

May I close with the entreaty that you consider it your responsibility and privilege to carry forward as rapidly as possible such researches as may affirm or disaffirm the position of your own great colleague. It is for you to answer this final question: *If the spirit of the race could speak as the spirit of many an individual has spoken, would it ask for charity, or would it ask for justice?*

THE TRUE ARISTOCRACY

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Students of heredity are inevitably eugenists: they are forced by their studies to recognize that men are not equal, are not even born equal save—and possibly this is all that Montesquieu had in his mind—in the eyes of the law:

> That equal justice with indulgent face
> May shine unclouded on the budding race.

They are forced to see that men come into the world endowed with different powers; that these endowments have descended to them from their progenitors and as regards any power, it may be either from the paternal or the maternal side, in such a way that the different members of one family from the varying admixture of paternal and maternal attributes themselves differ in their powers; that defects tend to be inherited every whit as much as do positive or beneficial attributes; that where any particular defect, or, equally, any beneficial property, is present on both sides the likelihood is that it will show itself in the majority of the offspring and then, it may be, in an intensified form; that, therefore, if the race is to be improved, or even to be kept from deteriorating, steps are to be taken to encourage the mating of those with the better endowments and to discourage the mating of the defectives. Whether they join the Eugenic Society or no, they are eugenists. And—though in so saying I may shock my audience—as eugenists they are, if not themselves aristocrats, believers in an aristocracy. Their desire is that for the good of the race the best shall prevail, that we shall be led and governed by them.

Now from the earliest times up to the present, man—and woman too—has sought after, and indeed experimented over, rule by the best. Or ever the tribal or clan system became established and for long generations after, the best woman either actively by her own will, or passively, by the superiority of his, became in the ordinary course of affairs the possessor, or possession, of the best, most virile man; and if in many parts of the world for a time, for reasons that are reasonably obvious, it seemed better to establish the matriarchate and the child became a member of its mother's

and not its father's family, nevertheless, everywhere that system died out from its inherent weakness. The woman might nourish and bring up, but but could not protect the family. The man must be the huntsman and provide the food and, what is more, must be depended upon to defend the family. And once from the family the clan system developed, for purposes of defence as for aggression and enrichment of the clan, it was essential to choose the most powerful, most resourceful, and most all-round man of the tribe as leader. It matters little whether he fought his way to the top, or found himself there through recognition of his prowess and free will appointment by the other men of the tribe. Such was the first aristocracy.

And in those simple days, seeing that this best man had a practically unfettered choice and that the most comely and capable girl of his generation was his to secure, the probability was that their children likewise would be of superior quality so that they in their turn would make the best leaders. Wherefore, through experience men came first to be prepared for and then to accept an hereditary aristocracy, acknowledging the existence of first families and finding it for the good of the tribe that an Amurath should an Amurath succeed, and Harry, Harry.

Now entertaining as it would be, more particularly here in New York, to trace the further development of this hereditary aristocracy until it came to include emperors and kings, and a succession of grades of nobility, and reached its fullest elaboration in the feudal period, I am not going to do this. All I want to impress upon you is that the elemental idea of an aristocracy is sound and natural, but, granting this, that thus far, however successful we may have been in the practical application of the idea to the establishment of the four-footed "aristocrats" of the turf and trotting ring, and in the breeding of animals possessing superlative speed or power or form or mass of flesh, be they racers or Clydesdales, greyhounds, red Berkshires or Plymouth Rocks, we have, to speak frankly, made rather a mess of it among ourselves, until to many the idea of an hereditary aristocracy of any order is intolerable, an opinion strengthened by the observation that those who most loudly proclaim their aristocratic relationships are most often such as those aristocratic relations least care to acknowledge, the said claimants having family and beyond that nothing of worth. Wherefore one has come to doubt the worth of family.

And yet so perverse is humanity that those to whom aristocratic régime is most abhorrent cling in their innermost hearts to their family tree and either pride themselves on the possession of this or that ancestor or upon the mingling of this or that stock into theirs. I may note incidentally that here, in this great republic, genealogy is pursued to an extent unknown else-

where. While those unfortunates who, to put it generously, can not look down their family tree, look up to the fair tree that is to spring from their loins and see its future growth to overtop its neighbors.

In other words, the love of good family, either as something already attained or as something to be attained, is inherent in the human race. We seek higher things. Through all the centuries we have been eugenists in principle, even if in practice we have made a painful mess of it. For in practice all these centuries we have mistaken accidentals for fundamentals, have elevated immediate advantages above future well-being. With royal and princely families the stamina and capacity of the bride to be has been the lesser instead of the prime consideration: the choice of consorts has been limited to a parlous not to say sinister extent, and the political importance of alliances between royal families has too often led to matings that could but result in a deteriorated progeny. And where, as in France, among the people in general, there is a well-established opinion as to the importance of carefully selected matings, there also the quality of the stock has been subordinated in general to the size of the 'dot': more has been thought of the property that will come into the family than of the richness of the blood that will be commingled. The results on the whole have not been any more satisfactory than have been those of the 'mate as you please' system which obtains in Anglo-Saxon countries.

Now, with the twentieth century, we have awakened to the fact that the principle of 'laissez faire' is as pernicious in the matter of marriage as it is in politics. Our eyes have become unwillingly opened to the fact that with the improved well-being of the people and the very material lessening of the death rate it has come to pass that the multitudinous children of defectives and those who both physically and mentally are of the lower order are forming the bulk of our population, since those who are pre-eminent, intellectually and bodily, marry late and have small families. In other words, the social conditions of the present day are such as to favor the preponderance of what are from every point of view the lower classes, the survival of the unfit and the inevitable deterioration of the race.

But here is the difficulty. Among what we regard as the lower classes are included not a few families of good quality, both mental and physical, which through accident, as for example, illegitimacy, or the fortunes of war, or the premature death of the breadwinner, are in poor circumstances, occupying a menial position. Circumstances have been against them. Thus it follows that from time to time we encounter men sprung from the ranks who, given the opportunity, come to the front and make their mark in the world of commerce or of intellect. Even when

the feudal system was at its height and when caste was most repressive, men of this order could occasionally, although rarely, force their way to the front, either through the Church (although then they still more rarely founded families) or through their military prowess as leaders of mercenary troops, or, like the Medici, through the city guilds and the power of the purse. The last, industrial, century, with its broad middle class forming a bridge between the working and the ruling classes has seen this becoming so frequent a phenomenon that it, with the equally obvious but, I think, less frequent examples of the decadence of families that for generations have been held in high repute, has led to what was a wide spread conviction, namely, that birth and breed counted for little and that fortunate up-bringing and environment are the more important factors in a man's success. Even to-day this opinion is held by a large number.

Now I am not going to discuss the still debated problem as to the extent to which environment modifies the individual and so the family and the race. I am going to satisfy myself with the well-established principle or biological law, that by cautious selective mating, qualities of very various orders, in man, equally with other animals and with plants, can be strengthened and intensified. I do not say that they are capable of indefinite expansion. We have, indeed, no proof that this is so. Rather the evidence indicates that we can, by selection, lead up to what I may term optimum development—development best suited to the size and state of other parts and properties of the individuals of any particular species in its particular environment. Developments in excess of this proper correlation may, it is true, show themselves in individual members of the species, but, even when mated with others showing a similar excess, the progeny do not exhibit the excess. Let me give an example of what I mean. By careful selection, proper feeding and surroundings, we can gradually improve the laying properties of various breeds of fowls, but this only up to a certain point. Occasionally, it is true, we encounter individual pullets of a particular breed who yield it may be ten or twenty eggs per year above this established optimum. But now it is found that if we mate the male and female progeny of such excessive layers, they only produce at most the optimum, indeed, most often less than the optimum. It is as though the exhibition of a particular property, above a certain limit, exhausts the individual in other directions and leads to deterioration rather than to improvement.

I am not suggesting therefore, that, the environment remaining unaltered, man, as man, is by selection capable of indefinite improvement. The most I urge is that to-day so large a proportion of human individuals is so far below the optimum that there is vast room for improvement: that under

modern conditions through the larger families of the unfit the race is deteriorating and not improving, and that it behooves us to take active measures whereby to encourage the selective mating of the best and the production of those endowed with sound and useful qualities.

Now the function of societies for the promotion of eugenics is, I hold, to promote this better mating, but, if I may speak bluntly, I am impressed with the fact that they have begun at the wrong end. Passing in review the pages of the volumes of the Eugenics Review what I find in them is, with all due deference to the high-minded ideals of the leaders of the movement, a vast amount of spade work in the establishment of the broad principles of heredity, a profound appreciation of Mendelism, sundry lamentations of latter day prophets, such as the most witty, albeit most doleful, dean of St. Paul's upon the downfall of Jewry, or more accurately, the sure and certain deterioration of humanity, the qualified approbation of sundry destructive procedures such as restriction of criminals and segregation of defectives as adopted by certain states, but with this singularly little constructive policy; or if I may so express it, a ha'porth of bread to an intolerable deal of sack.

Now possibly the leaders in this movement are acting most wisely in devoting their time to making sure the foundations, and in the first place driving home to people the extent and the dangers of national degeneracy. Possibly the fear of degeneracy is in this matter of eugenics the beginning of wiser courses. Nevertheless, I can not but feel that usually in this world with the planning of foundations there is requisite some considered design of the building that is to rise upon those foundations, and that design is here largely wanting.

As for what I have just termed the destructive procedures, I have strong doubts as to their politic value. Some experience of the world has taught me that while a majority of mankind is law-abiding and will obey commands of the order of "Thou shalt not," there exists a very considerable minority to whom such commands act as a stimulus or incentive to set them at defiance. Grave as are the consequences, prohibition of marriage on account of the existence of venereal disease in one or other of the contracting parties will not put a stop to such marriages; nor will segregation of the feeble-minded prevent those feeble-minded seeking or consenting to illicit conjugation whenever occasion arises. The ordinary every day individual, thinking only of matters of the moment and careless of the future, will not hesitate to transgress laws which interfere with his liberty. The only laws interfering with personal liberty that are generally kept are those the transgression of which is followed by a personal penalty, such as that of the

judicial murder of those committing murder. Public opinion is not as yet ripe for the infliction of castration upon those who, for instance, enter into the married state while knowingly sufferers from venereal disease, richly as they deserve it.

What is more, even granting that by these and like methods we reduce the number of defectives, thereby we only advance the average quality of the race: we do not actively increase the number of those of first-class ability. This I am glad to see is being recognized in the United States.[1] The need is to promote the propagation of the best in the race. And it is to show how this can be accomplished that now I want particularly to direct your attention.

In the first place, I would lay down that encouragement is more effective than punishment: that the "thou shalt not's" of the decalogue and older dispensation have given place to the blessing of the positive virtues of the new; in the second, that the war has supplied the solution.

Making enquiries as to the proportion of rejections from the British Army, to compare with the Canadian figures, it was my good fortune to be promptly appointed by my late colleague at Montreal, then minister of national service, now British minister in Washington, on to the scientific committee of the Advisory Council of his ministry—and as a member of that committee it fell to my lot to oversee the analysis of the physical state of the manhood of Great Britain in the last year of the great war. That you should understand the significance of this analysis and of the figures presented to us it is necessary that I enter into certain explanations.

I may remind you that service in the British Army had at first been voluntary and then as the situation and needs became more and more grave, first conscription became what I may term persuasive with "combing out," and then in 1917, became generally compulsory, all able-bodied men between the ages of 18 and 51 being called up. In the middle period, large bodies of men employed in industries of primary importance to the nation had been directed not to join the colors. Their industrial services, indeed, were deemed of such importance that then began that undue augmentation of wages which has been at the root of the present economic trouble in Great Britain.

[1] "While the need of cutting off defective and degenerate lines is becoming widely recognized and is being met with legislative enactment, there is as yet little organized effort to direct the evolution of lines among our mediate and superior classes." W. E. Key. Journal of Heredity, 11, 1920, p. 359.

For generations prior to 1914 men volunteering for military service had, prior to acceptance, to undergo medical examination into their physical fitness. Hitherto, this had been conducted by adequately trained officers of the Royal Army Medical Corps. The war with its sudden augmentation of the army and need for battalion Medical Officers and ambulance and hospital corps at the front and at the base found the corps all too small. Every well-trained man belonging to it was needed at the front along with many times the number of surgeons and practitioners enrolled out of private life. Inevitably the younger and more vigorous of these joined the army and went overseas, leaving behind the older and less vigorous who now were called upon not only to take over the patients and practices of their absent colleagues but also, without adequate training, to undertake for the government at different centers throughout the country the routine examination of would-be recruits for the army. The results were what might be expected. Many were passed for service who were totally unfitted, who subsequently had to be weeded out of the army at heavy cost to the nation; there were repeated cases of wide and inexcusable differences in the findings of successive examiners, damaging criticisms in the public press, and development of a feeling of public insecurity. As a result the government determined to take from the Royal Army Medical Corps the responsibility for examining recruits, and under the Military Service Act of 1917 it withdrew the matter of "categorization" from the army, placing it under the control of the minister of national service, who forthwith proceeded to organize the physical examination of the men called up, placing the task in the capable hands of Doctor, later, Sir, James Galloway, and a small but carefully selected committee.

The country was divided into regions, commissioners were placed in charge of each, with deputy commissioners and a staff under them. The deputy commissioners were brought together and trained so as to employ common standards and arrive at a common agreement regarding the categorization of border line and doubtful cases: a clear and admirable code of directions was placed in the hands of every member of the new boards and, in short, every endeavor was made to conduct the physical examination from one end of the country to the other under a single standard. Thus, at the end of 1918, it fell to our committee to direct an analysis into the results obtained from the physical examination of close upon two and a half million men conducted under their standardized conditions.

Here it will be out of place to detail the difficulties encountered in analyzing and weighing the figures before us. Those are to be found discussed in

the Government Blue Book containing the report of the committee drawn up by Dr. H. W. Kaye as secretary to the committee.[2] Nor again am I going to dwell upon the alarming picture this report disclosed of the widespread physical unfitness of the adult male population of Great Britain. That is apart from my present object. What is to the point is that for the purposes of arriving at the significance of the figures under review, Professor Arthur Keith, F. R. S., the distinguished anatomist and anthropologist, who was a member of the committee, pointed out that the established "categories" of the army, A, B, C, D,[3] could be translated into 'Grades' I to IV in the terms of the polygon of frequency.

Let me explain. It was found that a thousand Cambridge University students, measured for stature, arranged themselves in a significant manner. (The same has been found true of other exact human measurements.) In this particular set of men, those measuring more and less than this tailed off inch by inch on either side of this mean with striking symmetry.

There were roughly, within a few digits, as many men of stature 1 inch below this mean as there were men 1 inch above, and, from this mean of 5 feet 9 inches, those more or less in height formed classes tailing off in a curiously balanced manner. On such a "polygon of frequency" one can construct a curve of frequency.

Keith pointed out that the mean class (that of 5 feet 9 inches) together with all those above the mean and the class just below the mean, together constitute 70 per cent, of the total, and he assumed that the combined measurements employed to determine a man's physical fitness should follow the same general law. Along these lines he laid down that the active service group should include all average men and those above the average in physical fitness together with those just below the average, and that therefore we should expect in a reasonably healthy sample of the male population:

[2] Report upon the Physical Examination of men of military age by National Service Medical Boards from November 1st, 1917 to October 31st, 1918, London. February, 1920. Those to whom the British Government publications are not easily available will find an abstract of some of the main findings of the report in the *Lancet* (London), Vol. 1, 1920, pp. 557, 726 and 780.

[3] Category A. Men physically fit for active service at the front.

Category B. Men able to undergo a considerable degree of physical exertion and with fair hearing and vision, but in consequence of partial disabilities unable to stand severe strain; fit for any form of service overseas save active service at the front.

Category C. Men who in consequence of physical disabilities could not undertake marching but could be employed for the less arduous and sedentary occupations.

Category D. The rejected, unfit for any form of military service.

700 out of each 1000 should be "A" men, belonging to Grade I.
200 out of each 1000 should be "B" men, belonging to Grade II.
75 out of each 1000 should be "C" men, belonging to Grade III.
25 out of each 1000 should be "D" men, belonging to Grade IV.

As a matter of fact these index figures of Professor Keith showed themselves close to the mark and most useful for purposes of comparison. Certain mining and agricultural districts indeed yielded well above 700 per 1,000 Grade I men. Scottish miners between eighteen and twenty-one years of age yielded 80.62 per cent, young adult Scottish ironworkers 86.18 per cent. But while in general mining and agricultural districts yielded the expected 70 per cent or thereabouts, the great towns afforded conscripts gravely below the standard. I take the eighteen-year old group as that which should physically be fittest, least affected by the deleterious influences of industrial and commercial or sedentary occupations. Even in this most favorable class, studying the results obtained in different areas, cities like Liverpool and Birmingham yielded 49.5 and 36.0 per cent Grade I men, respectively: they were lower in the big manufacturing towns, for example 1000 youths in Burslem yielded only 270 in place of 700 physically fit for active service, in Dudley only 219. So serious a state of affairs was disclosed that it is of first importance to the nation to discover whether this is due to progressive deterioration of the town-bred and industrial stock or whether the effects of unfavorable environment on the growing individual are wholly responsible. For myself I cannot imagine the stunted and anemic mill-hands of Lancashire bringing forth offspring which under the most favorable environment could develop into men and women of full stature and all round physical capacity.

This, however, is away from my immediate point. What is of first importance is that the report of the Ministry of National Service has demonstrated that it is possible to establish a series of tests for the exact and uniform measurement of physical capacity and, having these, to grade those who undergo the tests into a succession of clearly defined classes.

For eugenic purposes, however, it will never do to take over the national service grading. We do not want to clump together the average, those just below and all above the average into one common group. That was well enough for determining men capable of becoming front line troops. But we need to select the best, not the average. Thus as I suggested three years ago,[4] just as the army for its purposes recognized three categories below the

[4] The Physical Census, an address delivered before the Medical Society of London, 25 November, 1918, and printed in the Transactions of that Society, as also in the Canadian Medical Association Journal, September, 1919.

mean, so for our purposes we might well establish, as shown in the diagram, three classes above, making in all seven classes. In this way Class A would contain the very pick of manhood, a select class of some 2 per cent of the whole body, men of exceptional all round physical development. Class B men thoroughly well developed, who might, only in some one respect such as stature, fail to be included in Class A; Class C, good all-round men distinctly above the average, while Class D would represent the large group of ordinary average men, and Classes E, F, and G would correspond with Grades II, III, and IV of the National Service system (Army categories B, C, and D).

This, however, is only half the matter. Neither Great Britain nor any other European nation made any attempt to pick out from the start the men most likely to develop into good officers and non-commissioned officers. For that they depended upon the actual test of army conditions. In other words, not a single European nation applied any test of intellectual capacity. It was left to the United States to apply this eminently rational procedure to the army she raised for overseas service. Scarcely had war been declared by the United States in the Spring of 1917 before the American Psychological Association brought together its members to consider how they might serve the country in the emergency.

It should be explained that the pioneer work of the late Prof. Alfred Binet, of the Sorbonne had made a greater impression in North America than it had in France or Europe in general. In 1905 Binet had shown that it was possible to devise reliable tests of mental capacity applicable for each year of age of the developing child, so that, according to the way a child responded to the tests, it might be accurately graded, e.g., a child of the actual age of ten years might be shown to have the mental capacity of, it might be, the ordinary child of twelve years of age, or on the other hand, only that of a child five years old. This method had been extensively tested by various American psychologists, more particularly for the elimination or segregation from the public schools of those mentally defective. Important advances in the methods of testing and evaluating the tests had been represented by the Goddard revision of the Binet scale, the Yerkes-Bridges Point scale and the later and fuller Stanford revision of the Binet scale, for which Terman was largely responsible.[5]

The chief purpose of the psychological assistance originally offered to the Army Medical Department in the Spring of 1917 was the prompt elimination

[5] There is abundant American literature on the subject, for which consult more especially the Manual of Mental and Physical Tests by Whipple, and The Measurement of Intelligence, by L. M. Terman, (Houghton, Mifflin Co.), Boston.

of recruits whose grade of intelligence was too low for satisfactory service. But when in the autumn in order to test the value of the methods of the committee, they were applied to enlisted men of all orders in four selected cantonments the results obtained tallied so closely with the more slowly acquired judgement of the officers in command as to warrant the recommendation "that all company officers, all candidates for officers training camps and all drafted and enlisted men be required to take the prescribed psychological tests" and in January 1918 the recommendation was acted upon. Every soldier was tested and assigned an intelligence rating on the basis of a systematic examination. Through this system, men of superior intelligence were selected from the first for advancement for special posts and particular types of military duty, or recommended to enter military training schools. A school for training in military psychology was established, and by Armistice Day, in November 1918, the psychological personnel attached to the Army Medical Department had risen to 120 officers and 350 enlisted men together with some 500 additional clerks engaged in the examining service in thirty-five camps throughout the country. The tests had been applied to 1,726,966 men, of whom 41,000 were officers; 7800 men had been recommended for immediate discharge on account of mental inferiority: 10,014 had been recommended for labor battalions, and other service organizations on account of low grade intelligence. Men qualified to be non-commissioned officers and candidate-officers on the basis of satisfactory intelligence scores were picked out within forty-eight hours of their arrival in camp.[6]

The new procedure must have proved itself eminently serviceable and practical to have become applied universally to all recruits within six months of its experimental introduction into the army. As a matter of experience, the rating awarded to a man as a result of the tests was found to furnish a fairly reliable index of his ability to learn, to think quickly and accurately, to analyze a situation, to maintain a state of mental alertness, and to comprehend and follow instructions. The score was little influenced by schooling or, more accurately, it was so influenced,[7] even though at the same time some of the brightest records were made by men who had not completed the eighth grade of the U. S. public school system.

[6] For further particulars see Army Mental Tests compiled and edited by Clarence S. Yoakum and Robert M. Yerkes, New York: Henry Holt and Company, 1920.

[7] Thus while stating (p. 22) that the rating was little influenced, Yoakum and Yerkes give a table showing that there was a steady increase in intelligence in the students of the successive years at the University of Illinois; 91.4 per cent of the freshman class were rated in the two topmost grades, as compared with 92.3 per cent of the sophomores, 94.1 of the juniors and 95.9 of the final year.

It is a not uninteresting coincidence that the American scale was worked out in percentages, 100 being taken as the highest available mark, and that here also seven classes were recognized namely:

A. (Rated 96 per cent and over.) Very superior intelligence—usually earned by from 3 to 5 per cent of a draft—men of pronounced intellectuality of the high officer type (if endowed also with capacity for leadership and qualities which admittedly are not revealed by the standard tests).

B. (80 to 95 per cent.) Intelligence superior but not exceptional. Obtained by 8 to 10 per cent of a draft—men of the officer type and many non-commissioned officers.

C. + High average intelligence, comprising from 15 to 18 per cent of all soldiers, with a large amount of N. C. O. material. With power of leadership men of this grade are fitted for commissioned rank. (The three C groups include those grading from 40 to 79 per cent.)

C. Average intelligence, the main mass (25 per cent) of soldiers. Excellent 'private' type.

C.— Low average intelligence (about 20 per cent of material). Men satisfactory for work of a routine nature.

D. (20 to 39 per cent.) Inferior intelligence (15 per cent of all soldiers). Fair soldiers but low in rank. Slow in learning with little initiative, rarely attaining higher rank than 'private.'

E. (0 to 19 per cent.) These along with D— are of very inferior intelligence. D— men were considered fit for service. Some E men were placed in labor battalions but most were rejected.

D— and E men were below ten years in mental age.

It deserves emphasis that the tests only indicate intelligence. They do not measure loyalty, bravery, power to command, or those emotional traits that make a man "carry on." Nevertheless, next to physical fitness, intelligence is the most important single factor in military efficiency.

Thus, to come to the point, the great war has in one respect been of service: it has afforded material for testing on a great scale and demonstrating the possibility of devising accurate and satisfactory methods of measurement of physical and intellectual capacity. Henceforth there can be no question as to the practicability of establishing standards of efficiency and quality. Nor is there any reason why these tests be not applied to women as to men. The method has been tested and found of proved value.

And what I would urge is that here at last we have before us the obvious line of practical work for eugenic societies and the eugenic movement in general. Encourage the best! Either organize, or make the state organize in every district a trained staff provided with a well-equipped set of rooms for the routine testing of every young person, whether male or female, who has reached the age of eighteen years. I say eighteen because, while intelligence does not, so far as we can see, improve beyond the standard which some

are capable of reaching at the age of sixteen, undoubtedly there are slow developers whose intellectual capacity, below normal at this life period, improves after the age of sixteen, while in general physical capacity is at its best at the age of eighteen, and from other practical considerations this latter age is the best for purposes of record.

Do not make the tests compulsory. What indeed is the need to trouble about the average man or woman. We want to pick out the best in the community. And having picked them out publish their existence in the world. Establish an annual record of all the A1 youths and maidens of the year, "A" standing for the first class in physical fitness, "1" for the first class in intelligence. Nay, I would say publish the list of all who attain to "A" and all who attain to "1" standards. There are positions in which physical fitness is sought after irrespective of mental capacity, and *vice versa*. Like considerations might favor the publication also of all the "B" and the "2" classes, for both are well above the average.

Think of the effect of such a publication. Think of the start in the world it would give to a man or a woman to be able to refer to his or her record as belonging to the A1 class; think of the status it would give him or her for the years to come, of the preferential treatment that would be afforded when applying for posts. Consider the preference the A1 man or women would have in marriage, how parents before giving their consent would require that he who sought their daughter's hand should produce his eugenic society certificate and show where he stood in physical and mental capacity; of the advantage the A1 man would have in seeking the hand of a desirable damsel. Think how in years to come these annual publications would establish the good strains, the desirable families with which to become associated, how in short they would become the human stud book.

But, it may be objected, the man who at eighteen is rated as A1 might from a variety of causes—tuberculosis for example, or grave accident such as fracture of the skull, or acute infectious disease, or venereal disease, or overwork, mental or bodily, fail to maintain his rating: the fact that in youth he was A1 is no assurance that by thirty he is not an undesirable. Quite so. But this is by no means an insuperable objection—once the published record appeared, the first-class man would come to ask to have his rating renewed so long as he continued to be first class, say every five years, at twenty-three, twenty-eight and thirty-three years, and if he could not produce certificates of continued efficiency this would tell against him, unless he could give a satisfactory explanation of the cause of his reduction in rank.

Now the indications are that there is a natural—or under present methods of life, an expected—reduction in physical efficiency after twenty-five years of age and of mental alertness after thirty-five or so. These would have to be taken into account.[8] So far we do not possess data sufficient to establish what may be termed the normal curves of physical and mental efficiency for successive age periods after eighteen.[9] The accumulated statistics of A1 men and women would supply material for the establishment of a table of what may be termed age-efficiency, mental and physical, for successive years of age from fifteen to fifty.

Here would be the ideal Debrett—here the establishment of a veritable aristocracy of the country, personal and hereditary. I ask you to think over it. The scheme is not impossible. It only needs to be started to show its usefulness. Nay, more, it would be self-supporting. Men and women of good quality would gladly pay a moderate fee to cover the cost of the examinations and for the cost of announcement and publication of their superior merits. Compare the cost of encouragement thus of the best to that of hunting out and suppressing the unwilling worst. Again, I say it only needs to be taken up seriously and started to demonstrate its value and desirability. Here at last we aid and encourage the improvement of the national stock, the advancement of the quality and well being of the nation through the establishment by scientific and democratic means, irrespective of wealth and influence, of the real aristocracy of the nation.

[8] See Adami, Loc. Cit.

[9] A beginning has been made. The Bulletin of the National Research Council on the Intellectual and Educational Status of the Medical Profession in the United States Army, by M. V. Cobb and R. M. Yerkes, (Washington, February, 1921) shows (p. 483) that there is no significant decrease in intelligence rating (of officers) rating from 20 to 26 years but thereafter to the age of 60 there is a marked decrease. The relations of intelligence to age of 95,742 medical officers examined at Camp Greenleaf gave:

Age of 25 (303 cases)	277
Age of 30 (334 cases)	258
Age of 34–35 (257 cases)	262
Age of 40 (305 cases)	255
Age of 44–45 (241 cases)	235
Age of 50–51 (131 cases)	223
Age of 54–55 (63 cases)	212

These figures indicate a slow descent from 25 to 35 and after that a more rapid one.

THE PRESENT STATUS OF EUGENICAL STERILIZATION IN THE UNITED STATES

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At the First International Congress of Eugenics, Mr. Bleecker Van Wagenen reported the progress which legalized eugenical sterilization had made in the United States prior to the year 1912. Since that time legislation, litigation and administrative advance have extended, and made more secure, the field of activity of this particular means of preventing reproduction by certain members of degenerate human stocks. No one, not even the most ardent advocate of sterilization, proposes to use this remedy as the sole agency for preventing parenthood on the part of human degenerates, but among advanced peoples, it must be rated as one of the four or five most practicable measures for purging the human stock of its more degenerate and worthless strains.

LEGISLATIVE NOTES

This paper is confined to a consideration of legalized eugenical sterilization in the several states of the American Union. In any state, therapeutic necessity is a sufficient legal authority for a surgical operation which, incidentally, may result in sexual sterility. In passing, it is worthy of further notice that in those states which have not enacted specific laws on the subject, it is possible legally for any duly licensed surgeon, with the consent of the individual, or, in case of mental incompetency, of the family of the patient, to sterilize sexually an individual for eugenical purposes, being governed in each case by the laws controlling surgical operations in general. Thus the border line between a therapeutic necessity and an eugenical desideratum, unless specifically drawn by the law, is very indefinite, so that the former easily includes the latter. But voluntary operations for purely eugenical purposes, left to the initiative of the family, are so rare in this country that they can hardly be considered to bear upon national eugenics, to any great extent. It is clear that in order to affect the future population favorably, by improving its hereditary endowments to a considerable

degree, the number of eugenical sterilizations must be numbered by thousands instead of by tens.

For the purpose of making the state the arbiter in such matters, a duty which it cannot avoid, fifteen of the American states have enacted statutes governing eugenical sterilization. The law is at present on the statute books, unattacked by the courts, and therefore still available for use, in ten states. Among these ten states, the law is functioning in a very satisfactory manner in California, Nebraska and Oregon. In Connecticut, North Dakota and Wisconsin, the law is being applied without challenge in a satisfactory manner, but to a very limited extent. In Oregon and Nebraska special executive machinery of proven competency is intrusted with the enforcement of the law. In Kansas and Iowa, it has fallen into disuse. In South Dakota and Washington, the statute is practically a dead letter. In New York, the law was declared unconstitutional by the courts in 1918, and repealed in 1920. In New Jersey, Nevada, Michigan and Indiana, the laws were declared unconstitutional by the courts, but are still on the statute books, dead letters.

Indiana was the pioneer state to authorize by statute the eugenical sterilization of certain persons characterized by hereditary degeneracy. This law became effective March 9, 1907. Under its authority over 120 males were vasectomized in the Reformatory at Jeffersonville, Indiana. But more than 500 such operations were performed in this same institution before the enactment of the law. Legislation followed in many other states. I have not time here to review this work in detail, but shall have to be content with pointing out several of the defects which experience proved the different statutes to possess, and to point out also the features of particular statutes which have proven successful, both biologically and legally, and which have, as well, been practical administrative successes.

LEGAL DIFFICULTIES

Many states, by law, applied this remedy to the inmates of certain named institutions. In case such institutions were prisons or reformatories, and sterilization was looked upon in any manner as punitive, it is clear that the imposition by law of such punishment would, if it were not ordered as a part of the original sentence, constitute a second punishment for the same offense and would therefore be contrary to our Bill of Rights. In Iowa the law was declared unconstitutional on these grounds. In the State of Washington, a law which was purely punitive, and eugenical only by implication, was declared by the Supreme Court of the state to be valid and constitutional.

Such punishment was held neither cruel nor unusual, was ordered as a part of the original sentence, and was considered especially appropriate retribution for certain sexual offences.

MOTIVES OF THE STATUTES

But the greatest difficulty which the several sterilization laws have met with in the courts is not the problem of two punishments for the same offense nor constituting a bill of attainder, nor being a cruel or unusual punishment. In the latter consideration the best laws have no punitive element about them, nor have they any special therapeutic consideration. As was previously stated, the present surgical laws permit, for medical reasons, necessary operations, regardless of whether or not they may cause sexual sterility. Due punishments are found by our present punitive system for all crimes, without calling sterilization into use. Race betterment is the only motive which eugenical sterilization laws have to justify them. The most successful statutes omit punitive or therapeutic purposes, and set forth only eugenical aims. Their one purpose is to exercise the undoubted right of the state to prevent reproduction by persons of proven degenerate stock, that is persons whose children, because of the inheritance of certain handicapping mental, physical and moral qualities, would probably be unable to develop into self-sustaining and valuable members of society, but which children, on the other hand, would constitute a drag upon the self-supporting portion of the commonwealth.

CLASS LEGISLATION

The principal legal difficulty makes it necessary to meet the matter of so-called class legislation. Some of the courts have held that the sterilization law which is applicable to epileptics within a state institution and not to epileptics of the same degree of degeneracy in the population at large, constitutes an undue discrimination, that is, it creates an artificial and unnatural classification, and is therefore unjust and unconstitutional in those states in which the constitution forbids class legislation. But not all states have made this very strict interpretation. Some have held the application to institutional inmates only to be a fair primary classification and not unduly discriminating.

PERSONS SUBJECT

It is possible, however, to circumvent such possible attacks by the courts by making all persons of the same natural hereditary degeneracy of the same

specific type, whether in institutions or without them, subject to the law. Indeed so long as a person remains in a modern custodial institution, there is no great danger of parenthood. Cacogenic persons in the population at large, and also such persons in custodial institutions who are to be discharged while still potential parents, are the logical individuals to make subject to sterilization for eugenical purposes.

It is clear that if a sterilization statute is to function eugenically, it must provide for the sterilization, early in life, of individuals whose degeneracy is of an hereditary nature, which degeneracy is of such a type as to prevent the making of useful citizens out of the possible offspring. A person may be blinded by accident and still carry hereditary qualities of the most valuable nature to the state. Such a person, although personally inadequate, is not cacogenic, and should therefore not be subject to eugenical sterilization. Briefly the persons subject, in the model law, should include all persons who, because of degenerate or defective hereditary qualities of definitely stated standards, are potential parents of socially inadequate offspring, regardless of whether such potential parents be in the population at large or inmates of custodial institutions, regardless also of the personality, sex, age, martial condition, race, or possessions of such persons.

ADMINISTRATIVE DUTY OR COURT FUNCTION?

Another legal consideration refers to the method of selecting persons who come within the eugenical sterilization law, whether it is permissible for the law, which states definite rules and standards, to delegate the selection of subjects to an administrative officer, as in the case of vaccination and quarantine, or whether the matter, which is not one demanding immediate action, but which is so tied up in fundamental values, both to the individual and the state, that court procedure for determination of the facts is essential in each case. Briefly, a review of the situation indicates that legislation is tending toward demanding court determination, or at least the privilege of a court review, in each particular case.

While the best laws are mandatory, the records show that most cases have had the consent and moral support of the family of the patient. There have, however, been a large number of compulsory and involuntary cases. Still in the process of selecting cacogenic persons for eugenical sterilization, and in ordering and performing the operation, it is of interest to note that there has been, up to the present time (January 1, 1922), no damage suits attempted against surgeons, officers or institutions.

TYPES OF OPERATIONS

The laws vary greatly in describing the types of operations authorized. For instance, the Indiana law provided "such operation for the prevention of procreation as shall be decided safest and most effective." Other states authorized "an operation for the prevention of procreation;" another demanded "asexualization." Another used the word "sterilization." Still another mentioned "vasectomy and salpingectomy." The best type of legal provision covering this point would read: "A surgical operation upon, or medical treatment of, the reproductive organs of the human male or female in consequence of which the power to procreate offspring is permanently nullified. In each case due provision shall be made for safe, skilful, and humane operation and treatment, and for securing the highest possible incidental therapeutic benefits."

STATISTICAL SUMMARY

In the actual working out of legalized eugenical sterilization since 1907, a careful study has found the following facts:

Prior to January 1, 1921, 2233 persons have been legally sterilized in the United States; 1853 were males, 1380 were females. By radicalness of operation, 3061 were the less radical surgically. Of these 1781 consisted in vasectomy of the male, and 1280 in slapingectomy of the female. Of the more radical operations there were 172, of these 72 were castration of the male, and 100 were ovariotomy of the female. By classes, 403 were feebleminded, 2700 insane, and 130 criminalistic. I shall next enumerate the operations by states: California—2558, Connecticut—27, Indiana,—120, Iowa—49, Kansas—54, Michigan—1, Nebraska—155, Nevada—0, New Jersey—0, New York—42, North Dakota—23, Oregon—127, South Dakota—0, Washington—1, Wisconsin—76. In examining this list, it is interesting to note that in the one state, California, practically two-thirds of all legalized operations for this purpose have been performed.

Eugenical sterilization laws have been vetoed by the governors of Pennsylvania, Oregon, Vermont, Nebraska and Idaho. Subsequently, however, Oregon and Nebraska enacted successful laws.

INSTITUTIONS SUBJECT

There have been legalized eugenical sterilizations in state institutions for the (1) insane, (2) feebleminded and (3) criminalistic. No operations legalized primarily for eugenical purposes have yet been performed in

a. State Institutions for the (1) inebriate, (2) the diseased, (3) the blind, (4) the deaf, (5) the deformed, (6) the dependent, (7) the epileptic, nor in

b. County, municipal or private institutions for any type of the socially inadequate, nor

c. Among the socially inadequate and cacogenic individuals in the population at large.

CONCLUSION

The extension of the provisions of the sterilization law to all cacogenic persons of a given legal standard, whether within public or private custodial institutions or in the population at large, is both a legal necessity and a practical requirement for eugenical effectiveness.

In the matter of legal authorization and control of eugenical sterilization, it may be safely concluded that the experimental period is rapidly passing. It is now known what attitude the courts generally will take toward specific elements in laws authorizing this method of preventing degenerate parenthood. Also the practical eugenical standard for sterilization is fairly well established. In any particular case this standard can be scientifically determined in a satisfactory manner, by medical diagnosis and eugenical field investigations. It remains, of course, in each case, for the courts to determine the facts thus presented, and to order the application of the law. The nature of administrative machinery which will work and which will fail, is, from the experiments already made, fairly well known, so that if the principle of eugenical sterilization has public support, practically any state legislature can, if it chooses, enact a well-functioning law, satisfactory legally, administratively and eugenically.

HEALTH AND EUGENICS

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1. There are six factors which have been chiefly responsible for the development of civilization—food, geographic and climatic conditions, race characteristics, social heredity, physical heredity or eugenics, and health. Each of these factors has had its own influence on the advance or the retardation of human progress. It is not necessary to evaluate the greater or lesser importance of each, since this paper is concerned only with health as affecting eugenics. In the final analysis it would be found that health depends on the other factors mentioned, and in turn influences at least some of them. There is a give-and-take between the factors, because life is a bundle of facts, not an abstract theory. All factors had their influence, although at certain periods and in certain countries one may have predominated over the others.

2. Eugenics aims at the improvement of the human stock by the mating of the best individuals. The term "best" is, however, purely relative. The very best specimen of a crab-apple is still very poor compared to a mediocre pippin or Baldwin. I venture to say that the best individuals from the famine stricken area of China are far behind the average of the United States. By mating the best of a particular kind, there will, of course, be some improvement; but it will not be much nor far reaching, because physical heredity moves only within the narrow lines of direct descent. The eugenist cannot seriously propose that only the fittest shall be permitted to marry without laying himself open to the charge of utopianism, or, if he insists, producing a revolution. Suppose that such a measure were seriously proposed in our country. According to the findings of the draft records during the World War, nearly 50 per cent of the men examined were found to be unfit for military duty, and a fair percentage had to be made fit by special exercises and diet. Who would dare to deny marriage to the unfit 50 per cent? Again, if we read that out of 20,000,000 school children in our country 15,000,000 suffer from defects which are partially or completely remediable, what are we to do? Telling them when they have grown up and are presumably worse, that they must not marry, would produce a revolu-

tion infinitely more serious than the one proposed by anarchists. And it would come immediately, without much premeditation and long drawn out philosophizing. Or suppose we let them go ahead and marry. What kind of a crop will we get? Plenty of presumably pretty fair crab-apples of the human species, but very few pippins.

Plainly the only sensible thing to do under these circumstances is to improve the health of the children and make them fit. Our educational Solons are still under the impression that health is a gift of the gods instead of the boon for which all social agencies must be set to work. New York City spent $40 on the education of a child in 1915; only 42 cents went for the improvement of health. Yet in 1917 there were 190,898 of these children found to suffer from some defect out of a total of 247,735 examined. The fact must be faced that civilization has its drawbacks, one of which is the impairment of health owing to crowding, congestion, speeding-up, etc. Eugenics must reckon with this fact.

3. Back of eugenics lies health; without it eugenics will always remain a *pium desideratum* of a few academic dreamers. They may work out the technique of how long haired and short-haired, black-haired and white-haired rabbits hand down these characteristics either in a straight line or by crossing; but little good will be accomplished thereby, at least in the human realm, however much the breeders of animals may profit from such experiments. Eugenists must make it one of their chief objects to join physicians, sanitarians, hygienists, sociologists, and others, in improving the health of the community, because only that way can a proper basis be laid for eugenics.

4. Proof. The statements made are capable of proof on the basis of many facts, only a few of which, however, can be considered here.

a. The tropics and sub-tropics have, except in a few favored localities and there for brief periods only, never produced any even moderately high civilization. The blame has variously been put on climate, race, and so on. Only within the last twenty-five years have we learned what the real reason is. These people have generally been in poor health owing chiefly to the endemic diseases of hookworm and malaria. In some regions as many as 90 per cent of the population are afflicted by one or both of these diseases. It is true, that these people survive generation after generation, and acquire a certain amount of immunity against malaria; they may become adapted to their environment, just as the birches do in high latitudes and altitudes. But these birches are dwarfed in size, and the tropical people are dwarfed in mind. Why? Because they cannot develop any high vitality when they are beset by endemic diseases almost from the cradle to

the grave. They are able to live, and perform the absolutely necessary work for getting the means of sustenance. Then they have to sleep and rest, because they are exhausted; they are unable to employ their leisure hours profitably by thinking, meditating and experimenting. The result is, that they have remained on the same low level of civilization for untold generations. Selecting the best men and women from these people as mates, will produce few results that are desirable.

General Gorgas and the United Fruit Company have proved that these very people may be turned into cheerful and industrious, alert and ambitious workers by being given proper food and being freed from endemic diseases; and that within a few years. It will, of course, take several generations before these people will be able to overcome the age-long handicap which a devitalized constitution implies.

b. The ancient Greeks and Romans thrived physically and mentally until their health was undermined; then they degenerated. The causes of this decline in health are variously stated to be due to vice, irreligion, malaria and the actinic or chemical rays of the sun. Whatever the causes, the fact remains that the Greeks of the period from 500 to 400 B.C. were tremendously fertile in the production of great men compared to the century from 400 to 300; and there was a marked decline in vitality during the latter period. One indication of this physical decline is the lack of military courage and prowess, for which Demosthenes rebukes his fellow citizens scathingly in his Philipics. The Athenians in their vacillation what to do against Philip of Macedon, talked about "hiring" 20,000 or 50,000 soldiers to fight against the invader. Shades of Leonidas and Miltiades! Athenians sitting at home and letting mercenaries fight their battles? It was, indeed, a marked physical decline.

What happens always, happened here. Devitalized men cannot originate and the later Greeks could not. They began to comment on the works of their forbears, they became learned scholars and traded the science and philosophy of their ancestors for a living as teachers of the Romans and Egyptians. There were plenty of expounders, but hardly any originators.

c. The greatest geniuses have enjoyed at least fair health; in many cases they were vigorous until near death at an old age. I know that this is a much debated question. Lombroso, Nisbet, and their followers have poisoned the modern world with the idea that genius implies either degeneracy or insanity. This is plainly untrue, especially if we look at the greatest men of genius. About the ancients we known comparatively little, except Socrates. He served his term in the Athenian army as a hoplite, an indication that he must have been a strong man in his youth; he was put to death

at seventy—a long life surely, especially for that age of proverbially short lives. Sir Isaac Newton died in his eighty-fifth year, and was, except during the last few years of his long life, not only a very busy man but a healthy man. Darwin was born with a good constitution which he unfortunately ruined, perhaps during the five years' journey on the *Beagle;* it stood him, however, in good stead as soon as he gave it a chance; and he not only accomplished a remarkable amount of work of the highest order, but lived to the age of seventy-three. Herbert Spencer is another man born with a good constitution which he ruined by overwork. Only a boy with first class vitality could, at the age of thirteen, walk 48 miles in one day, 47 the second, and 20 the third with very little food during the three days. He lived to the age of eighty-three, and accomplished a remarkable amount of work in both quantity and quality. The other member of this trio, Alfred Russell Wallace, passed the age of ninety, and kept vigorous in both mind and body till near his death. Among modern philosophers *Kant* and *Hegel* are perhaps unexcelled; they enjoyed good health, and Kant died at the age of eighty, while Hegel died of cholera at sixty-one—a disease which almost invariably proved fatal in those days. Among modern poets, *Shakespeare* and *Goethe* easily take the lead. The great bard of Avon was only fifty-two when he died; this is a good age considering his many activities as actor, dramatist, manager, and above all, boon companion in "merry England." He was able, notwithstanding the small compensation which actors and writers commanded in those days, to buy two houses in London, and another in Stratford. Of Goethe we know that he was an exceedingly busy man and that he enjoyed good health during his eighty-three years of life. He retained his vitality till death, and his mental vigor until within a year before, when he finished his greatest work, the second part of Faust. Among the famous Italians four stand out foremost—Dante, Leonardo da Vinci, Michelangelo, Galileo. Dante was only fifty-six when he died; this was, however a good age when one considers the many vicissitudes and the arduous labors of his life, which only a man of good health could have endured. Leonardo da Vinci was a person of splendid physique, outstripping younger men in feats of strength, and zealous in his multitudinous activities; he lived to be nearly sixty-seven years. Michelangelo worked with furious intensity up to his seventieth year, and then had enough energy left to plan and complete great architectural works like St. Peter's in Rome. He was poet, painter, sculptor, architect, excelling in at least three lines. He retained full possession of his faculties until his death at ninety. Galileo was active along many lines in science, enjoyed good health and made a name for himself by working almost to his death at seventy-eight. The

list of great men who had good health, could easily be extended, but the cases given will suffice to prove that men of genius have been healthy men.

d. The geniuses of today are usually men in good health, expecially those whose work brings them in contact with the objective world. The poets and philosophers are, perhaps, slightly inferior in this respect. There has, however, been a marked improvement along this line since we no longer connect genius with contempt for social conventions but require our "immortals" to behave seemly and decently.

5. Eugenists must endeavor to pay greater attention to all factors which tend to improve health, if we would improve the human stock and increase the chances for producing more men of genius. Galton has shown that eugenics must deal with all factors which tend either to improve heredity, or to develop the talent born. The general improvement of health will appreciably increase the chances for raising the average mental level; that may not necessarily mean an increase in capacity; but if continued for several generations it must produce that. Health means balance, coördination of the physical functions, buoyancy, and optimism. There is surplus vitality which tends to produce a finer brain and nervous system. These things furnish an admirable basis for a higher mentality, if they are not the causes of it. On a higher level of capacity a larger number of men of talent and genius will undoubtedly be born. This is not only Galton's law, but the experience of history.

6. If health is improved generally, at least three results may be looked for. Each is of the greatest possible social importance.

a. The field for eugenic marriages will become much larger. The few exceptionally healthy persons must at present, *volens nolens*, marry individuals of the opposite sex who are their inferiors in health. It is, of course, not an absolute necessity to marry; most persons will, however, want to marry, and the continuance of society demands it. If they cannot marry their first choice, they will be satisfied with second choice. In a society in which health is as poor as the figures in section 2 indicated, there must of necessity be many marriages which are not eugenic on either the man's or the woman's part. The few individuals in very good health, will likewise find it difficult to find healthy mates. This is a matter of statistics, not of pious wishes. Only the improvement of health in the community as a whole will remedy the situation and increase the chances for eugenic marriages.

b. Eugenics will be more readily adopted by a community which knows the value of good health. Where the majority of peoples are ailing and where the principal occupation of physicians consists in curing diseases,

the notion naturally comes to prevail that sickness is an inevitable thing which one, like death and taxes, cannot avoid. Poor health comes to be taken as something normal. If a community has a high ideal of health, if the physicians are occupied chiefly in improving sanitation, hygiene, and in producing a finer type of man—disease will be looked upon as something abnormal, and individuals will find it mighty hard to find mates. Healthy persons will not only seek, but will be able to find healthy mates.

c. With the improvement of health, vice and crime will diminish if not disappear. All modern investigations into vice and crime tend to prove that persons addicted to either or both are not normal physically, and that their health is usually below normal. They may not be sickly, but their vitality is low, making it difficult if not impossible for them to stand the strain of regular work day after day. The suggestion comes naturally to them to make a living in a less strenuous manner. The fact that persons addicted to some vice are usually very nervous and lack self-control, is a plain indication of poor health. Improvement in the health both of the criminal and of the vicious would at least diminish the frequency of crime, and remove an uneugenic factor from the community.

EUGENICS IN ITS RELATION TO THE TUBERCULOSIS PROBLEM

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The modern conception of tuberculosis as a not hereditary disease, while not absolutely correct from a strictly scientificial viewpoint, may be considered to be accepted by the vast majority of students of the tuberculosis problem in its social as well as medical aspect. Direct bacillary transmission, that is to say, cases in which the bacilli of tuberculosis are found in the placenta, do occur but are exceedingly rare. Prior to writing my article on tuberculosis for the "Twentieth Century Practice of Medicine," I looked up the literature on the subject and could only find that about 60 cases had been reported during the preceding forty years. Both medical and social workers have a right to consider this a negligible quantity and it is of incalculable advantage that the former strong belief that pulmonary tuberculosis, popularly known under the name of consumption, was a hereditary disease, is gradually disappearing. The assurance which may be given to the patient whose father, mother, or ancestry have been tuberculous, that he has not inherited the disease, and that the fact that some of his near relatives may have died of it is by no means an indication that he too must fall a victim, gives him the peace of mind and the hopeful outlook so essential to recovery from the disease.

If, however, direct bacillary transmission occurs as just stated only in the rarest instances, it behooves us as students of eugenics to find out how we can account for the prevalence of the disease in general and the frequency with which it occurs in children of tuberculous parents. Of course we know there are many post-natal causes of infection. When the tuberculous mother nurses the child she may infect the intestinal tract of the infant by her own milk which may contain the bacilli; or the child may be fed on milk from tuberculous cows. In some sections of our country statistics have shown that in no less than 10 per cent of the children infected with tuberculosis, the causative factor was the bovine type of the bacillus. Contact infection results when the mother kisses the infant on the mouth or if she carelessly coughs in its face and droplet infection ensues; or if the

infant is fed artificially she may insert the rubber nipple of the milk bottle in her mouth to test the temperature and sweetness of the milk; or in feeding the child some cereal, she may taste it from the same spoon with which she feeds the baby.

Aside of such well-known sources of post-natal infection and the infection in adult life arising from the careless disposal of the sputum of the tuberculous invalid, recent investigations have shown that there exists also a source of infection which, because it is so rarely recognized, is all the more dangerous. Prof. A. Calmette of the Pasteur Institute of Paris spoke of this source of infection at the recent tuberculosis Conference in London as "healthy carriers of tuberculosis." In other words, there are seemingly perfectly healthy individuals who, unknown to themselves, carry countless virulent tubercle bacilli in their system, and if they come in contact with a predisposed individual, particularly an infant or child, an infection is almost inevitable.

At the same Congress, Gerald B. Webb, ex-president of the American National Tuberculosis Association, made the following statement concerning this dangerous source of infection: "The question upon which we must be alert is that of the tuberculosis carrier. In so many cases a parent before becoming a manifest consumptive had been a carrier of disease and had disseminated millions of bacilli in his immediate neighborhood."

During the past twenty-five years antituberculosis workers have done their best to combat all the known sources of post-natal infection in child life and of communication of the disease in adults and these efforts have not been in vain. These workers claim that it is owing to their labors that there has been a marked decrease in the tuberculosis deathrate in our country. Some statisticians however claim that this lower mortality rate is due to the improvement in general sanitation and better nutrition of the masses which have reduced the deathrate in general and also that of tuberculosis. Be this as it may, to the tuberculosis worker must be given credit for having had a great share in this improvement in individual and general hygiene.

Educating the masses as to the prevention of post-natal infection in children as well as contact infection in adults has done and is doing incalculable good and in the view existing preventoria quite a percentage of the inmates who had been much exposed to tuberculosis and strongly predisposed by inheritance are apparently made strong and vigorous enough to resist the development of the disease. In almost every State of the Union there are numerous sanatoria and special hospitals, although as yet not enough, to treat, cure, and isolate tuberculous disease in its various stages. Yet thousands of tuberculous individuals still die annually in

spite of popular education, in spite of preventoria, in spite of numerous institutions for the treatment of the disease, and in spite of apparent advance in phthisiotherapy.

It cannot be said that our studies in immunity have advanced sufficiently to count in the reduction of morbidity and mortality of tuberculosis. These studies have made only one thing sure, namely that tuberculosis, in the vast majority of cases, was contracted during childhood and that the tuberculous infection which remains latent becomes tuberculous disease most frequently between the ages of eighteen and thirty-five. It is then that an inherited predisposition, a "habitus phthisicus," or an acquired predisposition make themselves manifest and the morbidity and mortality from tuberculosis is highest. Unfortunately these are also the ages in which the procreative functions in man and woman are perhaps at the highest point, where marriages are most frequently contracted and children most frequently conceived. It is thus in my humble opinion at this period when we should consider the importance of eugenics in its relation to the tuberculosis problem.

I stated at the beginning of my paper that the bacillus of tuberculosis is very rarely found in the foetal organs. What then is responsible for this predisposition to the disease? We know that the child is more often found tuberculous when the mother is the tuberculous parent. This is not only to be accounted for by the fact that the mother is in closer contact with the child, but I am convinced that the primary cause of the tuberculous predisposition is a mingling of the blood in the maternal and foetal circulation. The bacilli lodged in countless quantities in the tuberculous lung of the mother are constantly secreting toxins of varied virulence which enter the circulary system of the mother and cause fever, anorexia, and emaciation. The maternal blood, reaching the placenta and foetus, impregnated with toxins, affected all the cells of the future child and thus the foundation for the predisposition to the habitus phthisicus is laid (a constitution below par, a cylindrical or flat chest, long body, deficient muscular development and little adepois tissue, a tendency to contracting infectious diseases, and a particularly suitable field for the invasion and spread of the tubercle bacillus).

In the assumption that something is inherited from the tuberculous parent, with the exact nature of which we are not as yet familiar but which we know is very rarely bacillary, I do not stand alone. The greatest living authority on tuberculosis statistics, Karl Pearson of London, quoted in Baldwin and Gardner's recent contribution on the subject,[1] "considers that

[1] Edward R. Baldwin and Leroy U. Gardner: Reinfection in Tuberculosis, The American Review of Tuberculosis, August, 1921.

heredity plays a large part in transforming infection into disease." This means that in many cases where there has been a slight bacillary infection from without, which should have been sufficient to render the individual immune, the hereditary factor overcomes this and the infection becomes actual disease. This endogenous development of the disease without direct bacillary transmission is perhaps much more frequent than heretofore thought. To quote again from the just mentioned work:

> The British epidemiologist and statistician, Brownlee, mentions his acceptance of the theory of immunity conferred by childhood infection which, however, breaks down and causes two-fifths of adult phthisis from endogenous spreading. The inference is that three-fifths must be from exogenous sources.

Our recent war experience has shown us how many young people are physically below the standard health and unfit for military service, and that thousands of them are unfit for the duties of parenthood. For the following statistics I am indebted to the courtesy of Major General Ireland, the present Surgeon-General:

Rejections, selective service men, local and camp examining boards

	LOCAL BOARDS	CAMP BOARDS
Total	549,099	207,617
Pulmonary tuberculosis	44,305	14,612
Suspected tuberculosis	16,899	156
Tuberculosis of other organs	8,731	679
Mental deficiency	33,636	7,963
Defective physical development	5,604	1,756
Deficient chest measurement	2,105	194
Underweight	59,022	11,586
Underheight	6,556	2,060
Malnutrition	676	93
Bones and organs of locomotion	113,287	58,536
Arthritis	3,934	2,539
Syphilis	8,802	
Tabes	578	
Paresis	252	

The actual number of selective service men, first and second registration, examined by the local boards was 3,764,101.

The actual number of selective service men, first and second registration, examined by the camp boards was 2,745,073.

The statistics for 1,961,692 selective service men as published in "Defects Found in Drafted Men" have been raised proportionately to cover the complete number 2,745,073.

We are at this moment mainly concerned with tuberculosis, its predisposing causes, and their relation to eugenics. Among the just mentioned 3,764,101 men examined, there were 58,917 found actually suffering from pulmonary tuberculosis, 17,055 with suspected tuberculosis, 9410 afflicted with tuberculosis of other organs; 7360 were rejected because of defective physical development, 2299 for deficient chest measurement, 70,608 because of underweight, and 769 for malnutrition. These four latter conditions are well known to be factors predisposing to tuberculosis. But I go even further by saying that bone and joint defects, for which 171,823 were rejected, were probably also in the majority of tuberculous origin, which would mean 338,241 either actually tuberculous, suspected of tuberculosis, or by reason of their physical defects predisposed to the disease. If we add to this figure 9632, afflicted with syphilis and its sequellae, which also predisposes to tuberculosis, we have a total of 347,873.

It is not unreasonable to suppose that the same defects found in men at draft age would be found in women at about the same age.

What can, should, and must be done to remedy this appalling condition of our nation's health? From our studies thus far we have learned that in order to reduce the morbidity and mortality of tuberculosis, we must have, besides a rigorous individual and popular prophylaxis, a better physique, a stronger physical makeup. Against an inherited weak physique and physiological poverty in children and adults we must provide recreation centers where the masses can congregate and have plenty of fresh, pure air in winter and summer, particularly for prospective mothers, more maternity sanatoria, more open air and sanitarily supervised kindergartens, more parks and playgrounds, more open air schools, more outdoor school instruction, and more calesthenics and breathing exercises outdoors or with open windows at recreation time. Singing, recitation, botany, and geology should be taught outdoors whenever possible. Our municipal and school boards and public welfare commissions should combine to bring these improvements about. Compulsory military or physical training for boys and girls, encouragement for outdoor sports for old and young, and the utilization of roofs in cities where sufficient space for playgrounds is not available, should also demand the attention of our authorities and philanthropists. Last, but not least, a change from the complex city life to the simple and more healthful country life, a return to the farm from the over-crowded factory and tenement, should be encouraged in every possible way. This might be done by making farming more remunerative with the aid of the state and by making the social life in villages more attractive, particularly for the younger people.

The social causes of a weak physique arise from underfeeding, intemperance, bad housing, bad factory, mine and workshop sanitation, child labor, woman labor, the social evil, etc. These are also matters for the statesmen to attend to. These causes must be removed and without their removal eugenists will be powerless to achieve success in their endeavor to help in the solution of the tuberculosis problem.

The diseases which predispose to tuberculosis are numerous, particularly measles, diphtheria, typhoid, smallpox, syphilis, grippe, etc. Many of these diseases are preventable either by detecting the carrier as in typhoid and diphtheria, or by vaccination or serum injections against the disease. Others are usually curable, if discovered in time and properly treated. Medical science knows how to stop many epidemic diseases predisposing to tuberculosis, if the public would only trust it and if federal, state, and municipal authorities will aid.

What suggestions can we make to remove that strange and insidious source of infection which I have referred to as the healthy tuberculosis carrier whose existence has been heretofore almost totally ignored? How many might not have been discovered had time and opportunity permitted to examine every man or woman drafted for service so as to be sure that he or she was not a tuberculosis carrier? What should be done now, and how may many still be discovered? Obligatory examination for tuberculosis of all individuals wishing to enter wedlock, so that if he or she happens to be a tuberculosis carrier, transmitting the predisposition to his or her child, or causing post-natal infection may be avoided by careful instruction and guidance. There should be at least one annual examination for tuberculosis, typhoid, diphtheria, venereal diseases, etc., of all individuals desiring to pursue such occupations as nurses, dairy employees, dealers in milk, meat, or other food substances. This would be helpful in doing away with the danger arising from contact infection by many healthy tuberculosis carriers who are not aware that they are capable of transmitting the disease. The masses should be educated to the fact that a tuberculosis carrier, instructed, conscientious and careful with the disposal of his secretions, particularly of mouth and nose, is perfectly safe to associate with, and even marriage may be permitted.

There are also a number of useful citizens, men and women who are slightly affected with tuberculosis, knowingly or unknowingly, and whose tuberculous condition can only be detected by a most careful examination. They too may marry after their recovery, which is reasonably sure to take place if timely and properly treated. However a predisposed woman should never marry a man who has the above described habitus phthisicus, and

vice versa. When two individuals whose physique indicates a tuberculous tendency marry, their offspring rarely escapes the tuberculous disease. A single pregnancy in the woman predisposed to tuberculosis does not necessarily mean a development or aggravation of her condition, or a tuberculous infant, especially when the father is strong and vigorous, providing of course the mother has proper hygienic and dietetic care for a sufficient time prior, during, and after confinement. On the other hand, frequent pregnancies following each other in rapid succession, will surely undermine the mother's health, aggravate a predisposition or an existing slightly tuberculous condition, and will most likely bring into the world feeble and strongly predisposed children.

All this means that the solution of the tuberculosis problem is not possible without judicious, humane, and scientific birth control. Only healthy parents can procreate healthy children. When the children are too numerous so that most of them, and particularly the latter born, had no chance to develop into mentally and physically strong men and women, they in turn will have children frail and subject to disease. I have taken a careful history of many cases of tuberculosis covering a period of twenty-five years, and this has revealed to me that with surprising regularity the tuberculous individual, when he or she comes from a large family, is one of the latter born children—the fifth, sixth, seventh, eighth, ninth, etc. The healthiest children, as a rule, are those of young people who married at a comparatively early age. Eugenics has amply proven this and here again birth control enters as a factor. Young people, strong, and vigorous, would gladly enter wedlock if they would know that it was within their power to have only as many children as they could well provide for.

At the time of the marriage, the minister or magistrate who conducts this sacred act, or better yet, the official who issues the license, should hand to the couple a carefully prepared pamphlet containing instructions in parenthood and the duties and obligations this involves. Of course, no license for marriage should be issued except to such as have been found physically and mentally fit to become the fathers and mothers of the future generations. Individuals physically below par should be advised to delay marriage, and if that seems not feasible, they should be advised to delay having children until both, husband and wife, are physically in fit condition.

It is not necessary here to go into the details of the many moral advantages of early marriages, such as the diminution of prostitution and venereal diseases. Even in our well-to-do and healthy families, considered our best American stock and where larger families would be no burden, early marriages are unfortunately not encouraged. The opponents of birth

control love to dwell on the theme of so-called race suicide. If this is applicable, it should only be spoken of in such instances where health, wealth, and culture abound and still family limitation is practiced to a very appreciable and deplorable degree. Birth control in cases of a distinctly tuberculous father or mother, among the poor and underfed, is not race suicide but race preservation.

We lose in this country about 50,000 children annually from tuberculosis. What heartache and suffering the birth and the death of these 50,000 little ones, in many instances even unwelcome, have caused to the parents is difficult to conceive. There are overwhelming statistics to be found everywhere, showing conclusively that the larger the family, and particularly among those in moderate or poor circumstances, the greater is the deathrate among the children. As to the economic loss which the commonwealth sustains from bringing into this world thousands of children mentally and physically crippled, I will confine myself to tuberculosis alone where we have been able to calculate, at least approximately, what this unthinking procreation costs. I stated above that 50,000 children die annually from tuberculosis in the United States. Figuring the average length of life of these children to be seven and one-half years and their cost to the community as only $200 per annum, represents a loss of $75,000,000. Such children have died without having been able to give any return to their parents or to the community. Who will dare to calculate in dollars and cents the loss which has accrued to the community because so many mothers died of tuberculosis when an avoidable pregnancy was added to a slight tuberculous ailment in a curable state.

As eugenists we are interested in the possible results of birth control. Should our laws become more tolerant in this respect? Should birth control clinics become a general feature as they have been in Holland and are now in England? Should these clinics function not only to help the poor and sick woman to prevent too frequent pregnancies but also to help the healthy childless wife who longs for offspring, but hesitates to seek or cannot afford to pay for private expert advice, to have her often curable sterility overcome? If our government should be willing to spend as much money, or even a good deal less, for the study of the best possible and most careful means of preventing conception, the study of temporary or permanent sterilization of those temporarily or permanently unfit for parenthood, and on the other hand encourage the study of the causes of sterility and their cure in otherwise physically, mentally, and morally sound parents, so as to improve the human race in general, as it is willing to spend to improve our animal industry, what would be the result?

In answer to this question and in defense of my advocacy of a judicious birth control, I should like to quote just a few statistics from Holland:

> What is the physiological effect of voluntary artificial restriction of the birth rate? In Holland where the medical and legal professions have openly approved and helped to extend artificial restriction of the birth rate, the health of the people at large is shown by its general death rate, which has been lowered faster than in any other country in the world. At the first eugenics congress held in London in 1912 it was stated that the stature of the Dutch people was increasing more rapidly than that of any other country—the increase being no less than four inches within the last fifty years. According to the Official Statistical Year Book of the Netherlands, the proportion of young men drawn for the army over 5 feet 7 inches in height has increased from 24½ to 47½ per cent since 1865, while the proportion below 5 feet 2½ inches in height has fallen from 25 per cent to under 8 per cent.[2]

What effect has judicious birth control had on the tuberculosis death rate in that benign country? In a little over a decade Holland reduced its death rate from tuberculosis by over 40 points per 100,000; in 1904 its tuberculosis death rate was 184.3 per 100,000 and in 1915 it had fallen to 144.1. Even in the United States, the country which perhaps stands foremost in the attack on the environmental causes of tuberculosis, the death rate was higher, in 1915 being 145.8 in the registration area. What would it have been had we followed the advice of the distinguished President of this Eugenics Congress, Major Leonard Darwin, the illustrious son of the illustrious Charles Darwin! In his opening address President Darwin pointed out that there could be no race improvement without combating both environmental and eugenic causes at the same time. Had we in the United States attacked our tuberculosis problem also from the eugenic side, I believe the result in the reduction of our tuberculosis death rate would have been so startling as to arouse the hope of an absolute eradication of the disease.

I do not believe that before an audience of eugenists further arguments on my part are necessary to substantiate the bold assertion that without birth control we will not control tuberculosis. In a statement issued a few years ago by Dr. Haven Emerson, then Health Commissioner of the City of New York, and one of the best known authorities on hygiene and social welfare work, he said that any physician who does not give advice to his patient which will, if followed effectively, save her from any surgical risk, is not living up to his responsibilities. He further said: "The patients of the tuberculosis clinics are, in all intents and purposes, under the personal

[2] The Small Family System: Is It Injurious or Immoral? by Dr. C. V. Drysdale; published by B. W. Huebsch, New York.

care of the clinic physician. Wherever the patient's health might be jeopardized by the unavoidable risks and strains of pregnancy, such patients may, according to my understanding of the law, be informed as to how to avoid conception."

I have said that without birth control we will not prevent tuberculosis. I go further and say that without birth control the number of insane, mentally deficient, syphilitics, and criminals will not decrease. The support of these defectives costs the State of Massachusetts 35 per cent of its income, and the cost of maintaining such institutions in the United States in 1915 was no less than $81,000,000 (Fisher). Yet our institutional care for this class of dependents in asylums, prisons, reformatories, hospitals, etc. is only sometimes curative, more often only palliative, and rarely preventative. Birth control scientifically studied, judicially imparted, and carefully supervised, would in addition prevent such social and economic catastrophies as wars and famines, would decrease underfeeding and insanitary and insufficient housing, all of which are the precursers not only of tuberculosis, but of typhus, cholera, etc., and last but not least, of that social discontent undermining the very foundation of our civilization.

Even as great and conservative an authority on the subject of birth control as Dr. Irving Fisher, Professor of Political Economy of Yale, admits this. In his recent article "Impending Problems of Eugenics" (*The Scientific Monthly*, September, 1921), he has this to say:

> If birth control exercised by individual parents could itself be controlled by a eugenics committee it could undoubtedly become the surest and most supremely important means of improving the human race. We could breed out the unfit and breed in the fit. We could in a few generations, and to some extent even in the life time of us of today, conquer degeneracy, dependence, and delinquency, and develop a race far surpassing not only our own but the ancient Greeks.

Dr. Marie Stopes, one of the most distinguished of English advocates of birth control, very justly said at a recent massmeeting held in Queen's Hall in London: "Constructive birth control is the key of all racial progress. It should be one of the planks of the League of Nations' platform. It is the only true safeguard of international peace."

In conclusion let me repeat what I said recently in the preface to the new edition of a lecture on "Birth Control in Its Medical, Social, Economic and Moral Aspects"[3] which I had delivered some time ago before the American Public Health Association:

[3] Knopf, S. Adolphus: Birth Control in Its Medical, Social, Economic, and Moral Aspects; second edition, 1919, published by the New York Women's Publishing Company.

To any unbiased mind it must be evident that our very experience, before, during, and after the recent world war, answers all objections to judicious birth control in its medical, social, economic, moral and even spiritual aspects. What this world needs now—after the fearful catastrophe which was started by a nation in which unlimited procreation among rich and poor, the educated and the uneducated, the well and the sick, was not only encouraged but officially rewarded—is not a greater but a better population. The empire which sought world dominion and the enslavement of other nations had the highest birth rate and the most rapid growth of population, and yet, it was France, which had by its birth control produced not as many but better soldiers, who withstood the most terrific onslaughts of the enemy's hordes. The generals of the German army sacrificed their soldiers *en masse* in close columns; it would seem that these military leaders felt that the empire had produced such great masses of men that they did not need to be so sparing and economical with human life.

The world needs now and for all the future the very best kind of men and women, not servile masses blindly obeying war-drunk monarchs and militaristic rulers, not a mass of weaklings, bound to succumb before reaching man- or womanhood, unable to serve or produce. We need children, but only such as are welcome to the home which physically, mentally, and morally sound parents have provided. The parents being economically situated so as to be able to give enough food, enough clothing, enough playtime to their children and live in comfort and enjoy life themselves. The state will then be able to provide enough educational facilities for children, and child labor will be done away with. Parents and children of the present generation should receive a physical and moral training and practical education that with the help of a wise government and enlightened statesmen should be instrumental to create a future race of true men and women, physically, mentally, and morally sound, spiritually high minded, images of their Creator.

Let this great Congress of Eugenists strive to attain this end.

PREVENTIVE EUGENICS—THE PROTECTION OF PARENTHOOD FROM THE RACIAL POISONS

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The principles of eugenics have been defined, and were submitted to the First International Congress of Eugenics by the writer, as follows:

Positive eugenics, the encouragement of worthy parenthood.

Negative eugenics, the discouragement of unworthy parenthood.

Preventive eugenics, the protection of parenthood from the racial poisons.

The action of poisons upon the germ-cells, or, more probably, upon gametogenesis, has been called blastophthoria by Forel. Since these poisons, fortunately few, thus strike at the race, I gave them, in 1906, the now generally used name of *racial poisons*. Lead and alcohol are the most noteworthy of them, but I will not here attempt to recapitulate the evidence, much of which may be found in the chapter "Racial Poisons," for which I am partly responsible, in the sixth edition, 1920, of "Alcohol and the Human Body," by Sir Victor Horsley and Dr. Mary Sturge (The Macmillan Company) and in my volume, "The Eugenic Prospect" (London, Fisher Unwin; New York, Dodd, Mead & Co., 1921). It will, of course, be obvious that, in order to demonstrate that these agents act by blastophthoria, we must obtain evidence from their action on the father alone. This has been done by breeding experiments and microscopic study for alcohol, and by breeding experiments alone for lead in the lower animals; and by the *post-mortem* microscopic observations of Bertholet in Lausanne, and Weichselbaum in Vienna, for alcohol, in man. This work of Bertholet has been ignored by Prof. Samuel Holmes of California in his chapter on this subject in his volume, "The Trend of the Race," 1921.

The case against lead as a racial poison has been met by various legislative enactments designed to prevent industrial poisoning, especially among women of child bearing age. Tribute should be paid to the work of Sir Thomas Oliver, of Newcastle, England, in this connection.

The idea of alcohol as a racial poison is illustrated in the Jewish story of the injunctions of the angel to the future mother of Samson, in the legislation of the Spartan, Lycurgus, and in the Roman myth regarding the deformity

to Vulcan, supposed to have been conceived when his father, Jupiter, was drunk. In Great Britian, a decade ago, Prof. Karl Pearson published a statistical inquiry directed to the opposite conclusion. It suffices here to observe that he included in one category the children of abstainers and of so-called "moderate drinkers," and that in no case did he ascertain whether the parental alcoholism occurred before or after conception of the children who were to demonstrate its results.

By general consent, the most striking paper read at the First International Congress of Eugenics in London in 1912, was that of Dr. Mjøen of Christiania, in favor of my present and lifelong contention. In 1918 the authoritative British Committee appointed by the Chairman of the Liquor Control Board, including Professor Sherrington, President of the Royal Society, Sir Frederick Mott, Professor Cushny and Prof. William McDougall, reviewing the evidence of that data, reported thus:

> These observations and experiments would thus appear to indicate that parental alcoholism may have a seriously detrimental influence on the stock; and if the results are confirmed by further investigation, it will be reasonable to conclude that this is probably one of the most important modes in which intemperance threatens the health and well-being of the community. But, in view of the extreme importance of this conclusion, it is clearly desirable to suspend judgment until the work has been controlled by other inquirers.

The "further investigation" then asked for has now been made. Professor C. R. Stockard has continued his work, confirming his previous results, at the Rockefeller Institute: Arlitt and Wells have obtained, in rats, results similar to his in guinea pigs; and Dr. Alexandre Kostitch has confirmed and admirably extended the work of Bertholet in man. ("Action de l'alcoolisme expèrimental sur le testicule: ètude hikologigne et chimique." Mèse présentèe pour le Doctorat de l'Universitè de Strasbourg, 1921.)

In 1920 appeared the Second Report, ("Problems of Population and Parenthood") of the National Birthrate Commission, (1918–1920). As a member and witness, I had had the advantage of seeing for myself the work of Stockard and Papanicolaou at the Cornell University Medical School in New York. Those experiments have been decried in Great Britain by critics who have not seen the work for themselves, but who dislike it because it is American, or because it incriminates alcohol, or because they wholly misunderstand (as some very distinguished eugenists have done) the wholly irrelevant proposition of Weismann that "acquired characters are not inherited;" even though Weismann himself, who is much more frequently quoted than read, expressly states that alcohol and

other poisons may damage the germ-plasm, but that such damage in no way affects his contention (true or false) about "acquired characters." We may note that Professor Stockard's work continued during the past nine years, was not designed to incriminate alcohol, but simply to learn whether any agents given to parents can affect their offspring's qualities, whether for good or evil.

In view of the evidence, old and new, placed before it, the National Birth rate Commission unanimously reported last year, confirming and extending the findings of Lord D'Abernon's Committee two years previously, as follows:

> The evidence summarized in this section establishes beyond question the fact that parental alcoholism is capable of exercising an injurious influence on the birth rate, both from a qualitative and a quantitative point of view.

No conclusive evidence is known to me as to the blastophthoriac effects of acute alcoholic intoxication—as imagined in the myth of Vulcan. As for chronic intoxication, which need never remotely approach "drunkenness," we may regard its quantitative effect upon the (live) birth rate as relatively small, though this conclusion is only tentative and awaits investigation of the question raised by myself (The Lancet, January 3, 1920) whether alcoholism may not account for some of the very large number of still births hitherto attributed by obstetricians to no known cause. Apart from that, the finding of the Commission was that alcohol is more disastrous in its action upon the quality of the next generation than upon its numbers.

The final upshot and moral of all these findings will be found in the brief principle which I have been reiterating for fifteen years: "Protect parenthood from alcohol."

After a third visit (1921) in successive years, this time covering ten thousand miles, to the United States and Canada, my view, gradually formed during previous visits, is confirmed. On the most generous estimate, the quantity of alcohol consumed per head in the United States last year cannot have been one-sixth of that consumed in Britain. In Canada even, when consumption was highest, many years ago, it was not one-fourth of the British quantity per head. Whether then or now, the relatively small proportion of alcohol flowing through the national blood in the United States and Canada, flowed very little indeed through the young blood of adolescence (which I call pre-parenthood), and least of all through the blood of girls and young women.

The suppression in North America of this racial poison, now rampant amongst the young in certain famous parts of Europe, foreshadows an

epoch making contrast between the historic European races in Europe and North America respectively—racial decadence in the Old World, racial ascendance in the New. The most important product of America is Americans; the most important product of Canada is Canadians. That is why this eugenist from the Old World pays homage to the two young nations which are practicing preventive eugenics in this foremost respect; thus saving their future and making straight a highway for positive eugenics and the exaltation of the race.

THE EVOLUTION OF THE CONSCIENCE IN CIVILIZED COMMUNITIES IN SPECIAL RELATION TO SEXUAL VICES

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That the mental and moral qualities of mankind are inherited to the same extent as are the physical characters is now so firmly established that we have some difficulty in realizing the opposition which early investigators encountered in establishing this fact. We may recall, however, that Wallace who arrived independently of Darwin at the idea of natural selection, denied that the moral qualities, and even the powers of esthetic appreciation, were evolved in the natural course of evolution from the humbler attributes of the lower animals, but expressed his belief that they were conferred upon mankind by a special act of the Creator. We may recall, too, that the best years of Galton's life were spent in collecting the biographical material by which he made it evident that the differences which men show in their intellectual gifts, in moral stability and in artistic power, are innate in the stock from which they spring, and are handed on in the same manner as physical differences to their descendants.

Since his time, numerous carefully conducted experiments have proved the fact beyond question. It will be sufficient here to cite the concurrent testimony of the method of experimental psychology applied by Thorndike, that of the correlation between mental characters applied by Pearson to English school children, and the genealogical method of Galton, by which C. B. Davenport has been able to show clearly the natural inheritance of numerous special traits. I am not, however, aware that attention has been called to the historical evidence of the changes in temperament and moral disposition which have taken place in certain civilized communities during historical times, and of which it is possible to indicate the selective agency.

The practice of infanticide represents man's earliest attempt to check the natural increase of population for the sake of the economic advantage, which, as Malthus has shown, follows from the restriction of numbers. It has been found to be widely practiced among uncivilized peoples, especially where, as in the islands of the Pacific, the evils of overpopulation are apparent. In these cases the act of infanticide is popularly regarded as a

moral action, and in some cases it is to some extent compulsory. In the same way the early Greeks, and the primitive Teutonic peoples in their state of barbarism, practiced infanticide. In Arabia, before the time of Mohammed, female infanticide was exceedingly common, and was even regarded in the light of an honorable duty, in that it relieved the tribe of the burden, serious in that country, of additional mouths to feed.

Among civilized peoples on the other hand, the practice of infanticide is held in abhorrence, and when practiced is performed surreptitiously and regarded as a serious crime. The religions of all civilized communities, of China and India, and the various sections of Mohammedans, Jews and Christians, all agree in condemning infanticide; although public opinion may connive among Mohammedans at the act of abortion, or among Christians at the prevention of conception, acts which attain the same economic advantage by less savage methods. The majority of civilized persons would feel themselves almost physically unable to slay a newly born child, and making all allowance for the effect of use, we cannot but be shocked at the callousness with which savage men and women carry out this custom.

Now it is evident that the natural instincts of the father and mother must offer some resistance to this practice, even when it is performed under the pressure of need. Moreover, we cannot doubt that savages, like civilized folk, differ among themselves in their degree of callousness or sensibility. The feeling of aversion and repugnance to the cruel act must be more strongly developed in some parents than in others, and since infanticide is always to some extent at the discretion of the parents, it cannot be doubted that these have the larger proportion of offspring. In this way there is a natural tendency, wherever infanticide is practiced, to strengthen the feelings of tenderness and compassion towards the newly born child, by the natural elimination of those who are most willing to murder their offspring, for the sake of an easier or a freer life.

Amongst wholly savage peoples, although infanticide is not usually regarded as wrong, it is probably not practiced more frequently than necessity exacts; because the foresight of the savage is short, and the conditions of savage life do not admit of the accumulation of wealth. With civilized peoples, however, the conditions are very different: the accumulation of property is now not only possible, but is the natural aim of the more ambitious. The temptation to infanticide is, therefore, much stronger, and the corresponding selection of the moral instincts which resist this temptation is correspondingly severe. When we realize that all long-civilized peoples have been purged of their more murderous elements by

passing through this period of severe selection, we are in a position to realize why it is that the religions of civilized peoples so unhesitatingly condemn infanticide.

An example of such a transition period is supplied by the Arabs. In the Times of Ignorance we have seen that the pressure of occasional famines compelled the nomads to slay a proportion of their female children. Doubtless they were growing more and more unwilling to follow this custom, as is suggested by the fact that we hear of reluctant parents being urged to do so for the sake of their tribe. But when Mohammed commenced his career as an obscure religious teacher in Mecca, we perceive the extent to which their consciences were rebelling against the usages of their ancestors, by the importance which this little gathering of the faithful attached to abstaining from infanticide. It is abjured in one of the few clauses of the First Homage, and is repeatedly forbidden in the Koran. One of the first acts of Mohammed after his conquest of Mecca was to obtain an oath of abstinence from infanticide from the Meccan women.

If it be conceded that the selective effect of infanticide is gradually to extinguish those hereditary types of temperament which are least unwilling to conform to this savage custom, a similar selective effect is to be expected from the equivalent act of feticide or abortion, wherever this practice is sufficiently common. The history of the evolution of moral opinion in ancient Greece and Rome during a period in which feticide was very widely practiced, will therefore be of some interest.

In the fourth and fifth centuries B.C. no opprobrium seems to have been attached to this practice. We find high-minded men, of the greatest moral weight, commending its utility. Plato advocates it for eugenic, Aristotle for economic motives; just as high-minded men of our own day may be found to advocate contraception. A few centuries later opinion has changed somewhat: Pliny is almost apologetic, "the great fertility of some women," he says, "may excuse such a license." Seneca is more severe: he gives special praise to his mother Helvia for never having committed feticide; he ranks this act among the follies and vanities of the fashionable world. We may see by these instances and by many other less direct indications, that a profound change had taken place in the popular conscience of the Roman Empire, before Christianity was known. But a few centuries later, what had seemed high minded and patriotic to Plato and Aristotle, a venial offense and a fashionable folly to Pliny and Seneca, was anathematized as a damnable sin by Tertullian, and made a capital offense by Valentinian.

Now it cannot be maintained historically that this change of moral values was due to the preaching of Christianity, for it had progressed far before Christianity was heard of. Yet its connection with the rise of the Christian faith was none the less intimate, and in the later stages the question was one of Christian against Pagan morality. The function of the early Church was not to introduce but to confirm with divine sanction, those sentiments towards sexual morality, which had been produced by centuries of selection by feticide. It was by its appeal to the individual conscience, the innate moral nature, that this revolution was wrought by the early Church; for in the Gospel Story there is no mention of feticide. It is further clear that this change in sexual morality was not brought about as an indirect consequence of the humanitarian spirit of Jesus's teaching; for the early Fathers and their followers complied with the dictates of their consciences, with what moderns would regard as an excessive ferocity. The temper of the reformers is shown rather by the cruel law of Valentinian which condemned to death the women guilty of feticide, or to the edict of Constantine under which illicit lovers were thrown to the beasts in the amphitheater, while slave accomplices were put to death by a draught of molten lead. The extraordinary doctrine of the damnation of unbaptized infants, even if born dead, shows how far sentiments had changed from the spirit of the Gospels.

The Christian religion then, like the religion of Mohammed some centuries later, came to a people whose moral evolution had advanced beyond the traditional usages of society; and by appealing directly to the individual conscience generated a code of sexual morality in accordance with the most advanced instincts of the time. The supernatural sanction attached to this code has preserved it through the centuries, even among peoples like those of Northern Europe who practiced infanticide without compunction in the early centuries of the Christian era. Greater and nobler in every other way than the degenerate citizens of the Roman Empire, the Barbarians of the North, were yet undeveloped in those instincts of reproduction needed for civilized conditions of life, which the peoples of the Mediterranean had developed. Even at the present time this difference appears in vital statistics: wherever equal comparisons are made in civilized conditions it is found that the Jews have the highest rate of reproduction, next come the Roman Catholics, and last the Protestants. The Jews lead because they are, of all, the most anciently civilized; while the Roman Catholics, mostly from Mediterranean lands, have had many more generations of selection under civilized conditions to modify their primitive instincts than have the peoples of Northern stock. In doctrine, too, the same point is brought out. The modern method of the limitation of popula-

tion by contraception is condemned by the religious heads of the Jewish and Catholic Churches, whilst Protestant peoples are irresolute without any very decisive moral opinion.

During the latter quarter of the last century contraception became an important factor in reducing the birth rate, especially in the upper classes, of all civilized communities. Hitherto only one aspect of its selective action has been widely noticed: namely, that it increases the disparity in reproduction between the upper and lower classes, and is to that extent dysgenic. That there is another and an important selective effect will be apparent to those who have followed our argument respecting the evolution of moral temperament among the Arabs and the peoples of the Roman Empire. When contraception is widely practiced, those who find such methods repugnant to their moral nature, will on the average have the largest number of children. Future generations will be more and more largely composed of those whose feelings towards the methods of contraception may be compared with those of the early Christians towards abortion. The greater the economic pressure to which they are exposed, the more severe will be the selection, and the more fiercely and clearly will their new morality be branded upon their conscience. Morals forever of the same intensity as those which destroyed the Pagan Empire in Europe, or which in the seventh century flung the illiterate Bedouin as conquerors across half the world, are developed gradually through centuries of hardship, degradation and temptation. In such a period as that which now lies before Europe is prepared the seed bed of a new religion.

HEREDITY AND VENEREAL DISEASES

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The venereal diseases, aside from the medical aspect, have been even in the time of antiquity—a problem in human nature, and in the moral strength and weakness of the social order, in the solution of which every author on this subject has in one way or another contributed something. By their importance, relative frequency and economic value to the human race they are today the most discussed, the most insidious, and they have moreover become the most interesting of all the diseases, which in a measure, may be due largely to their public promiscuity.

It was not until the end of the eighteenth century that the separate identity of the two venereal diseases, syphilis and gonorrhea, was generally accepted. Is it to be wondered at that such an infectious disease as gonorrhoea caused by a pathogenic microbe would greatly spread in the human race attacking relentlessly alike the innocent and the guilty when it was until the fourteenth century regarded as a simple catarrh produced by various irritations? And are we therefore to be so much surprised when we are told by some writers that as many as 60 per cent of all men have or have had gonorrhoea at some period of their lives, it being far more prevalent in men than in women? It is a disease that frequently makes an invalid of a woman, in all probability unsexing her by causing sterility and is accountable for a large percentage of the blindness in our asylums today, as well as most of the major gynecology of today.

As to syphilis, for nearly four centuries the medical world has been divided on this subject. Certainly there can be no doubt from the scrutiny of past records of its existence in the old world, both in prehistoric ages and in times of which we have records.

Heredity has indeed an important bearing on this disease. Congenital or inherited syphilis concerns the conveyance of a very serious disease from one or both parents to the offspring with all its consequences to the child directly affected, and because of its contagiousness to other persons who may come in contact with the child affected, it becomes a social question of paramount importance. The term "congenital" does not

imply that the inheritance is obvious at the time of birth, for it may easily be that no sign of the disease becomes apparent until long afterward.

We are all more or less familiar with the fact that the bacteria and other microbes of infectious diseases, produce their effects by the chemical substances which they liberate into the blood during their growth into the body or when they die in the tissues.

Syphilis is a toxi-infection due to the Treponema pallidum, an infection acquired by contagion or transmitted hereditarily, capable of affecting all the tissues and organs of the body and giving rise to lesions or symptoms for years. It is not rare to have manifestations of the disease twenty or twenty-five years after its first beginning. Cases have been reported forty, fifty and even sixty years after its first appearance. It is transmitted to the embryo through the ovum or spermatozoa or through the infected blood of the mother rendering the embryo also syphilitic. The presence of this organism exerts an unfavorable influence upon the embryo or fetus; that is the development of various embryonic tissues destined to form a perfect fetus may totally or partially be inhibited, causing abortions, premature births, still births. Or the fetus may be born alive and present some of the characteristic symptoms of syphilis, or what frequently happens, appear perfectly healthy at birth and soon after give evidence of its syphilitic taint in signs such as lesions upon the skin, moist papules or mucous patches about the nose, mouth and genetalia. Or there may be nothing present for months or years, the disease being latent and becoming manifest possibly in late years in far more destructive processes invading not only the superficial tissues, but also various organs and bones.

Fournier reports 562 cases of which 60 occurred after the sixth year and some even as late as the eighteenth year.

Of 2172 infants under observation during 1918, 783 or 35.13 per cent showed clinical signs of congenital syphilis.

Osler states in a memorandum on venereal disease and child hygiene in 1920, "There are more families in the community with the luetic than with the tubercular taint."

The offspring of syphilitic parents may not show those lesions just described but may only show a lowered vitality predisposing to various other affections. Such offspring may harbor undetected latent infection. It is a well known fact that a child born of such parents is as a rule at birth marasmic, puny and weak, with some times a wrinkled skin giving to the infant an old wizened appearance, which has been likened to a monkey because of its senile and decrepid condition.

A certain authority seems to make a distinction between a germ damage and a germ infection, and the marasmic condition of a syphiltic offspring is a frequent and a lasting one even after birth without showing any specific lesions. But it seems more probable that such a child is syphilitic, and some day we may find a method of detecting the presence of syphilitic infection in those who do not prove to be syphilitic by the present methods of the detection of syphilis. As a matter of fact, I believe a large number of this class of children will give a positive sero-diagnostic reaction. A negative Wassermann in the remainder of this group does not prove that they are not syphilitic, because a negative Wassermann does not exclude syphilis in any form or stage of syphilis. Hence such cases can be regarded as congenital syphilis and not suffering from a post infection marasmus which would mean a germ damage. Therefore, these children are, of course, more prone to suffer from nervous or mental diseases. This is one of the most important problems that should particularly fall under the care of Eugenists.

After the period of latency, there will follow a group of very peculiar affections among which are chiefly inflammations of certain parts of the sense organs, namely, the eye and ear. Thomas states that a study of the eye and nervous system will convince any clinician of the existence of third generation syphilis, or more. He claims that a study of the optic nerve opens wide a window through which we can see a new army of heredo-syphilitics, and he states that by heredo-syphilis is meant syphilis of the second, third and fourth generations, and possibly more.

Haberman points out as of vast importance in clinical psychology that suddenly out of a clear sky, symptoms may appear—the child advances normally up to its tenth, eleventh or twelfth year, and then without apparent or ascertainable cause, ceases in its mental development or begins to deteriorate, as is shown in backwardness or in speech defects of various kinds. He states the mental deterioration may involve the ethical or moral sense: Though nurtured in a good family and in refined surroundings, such an individual may become ungovernable, coarse and even shameless, have attacks of rage, do violent things, lie and steal, and even stoop to prostitution. The importance of these facts in relation to juvenile delinquency is obvious. Many a juvenile male factor has to thank his miserable state to the unstable nervous system bequeathed him by the syphilis of an ancestor.

From an extract of a report of the Assistant Surgeon General Pierce before a subcommittee of the House Committee on appropriations, 1920, I quote the following:

The inefficiency that is due to veneral diseases was very marked in the army. More than four men in every thousand were always out of action because of these diseases. If we applied that same rate to the coal miners in the country—and it is fair to assume that coal miners would be subject to syphilis and gonorrhoea equal to that of the men in the army—it would mean that there were two million tons of coal not produced last year on account of the miners being sick with venereal diseases. Probably one-half of all the abdominal operations on women are due to gonorrhea. The yearly cost to the United States of venereal diseases is a subject, of course, which can only be estimated; we will never know accurately just what these diseases cost the people of the United States, but we have some data of which we can be sure, and we can include that proven data in a table and present it without any fear of contradiction. For instance, it costs about $10,000,000 each year for the care of insane due to venereal diseases. We can estimate that the annual economic loss on the insane would be $250,000,000; that is, if these people who are in the insane asylums were not there but out at work, they would be worth $250,000,000 to the country. There is a cost of $3,600,000 for blindness due to venereal diseases and $10,000,000 is expended on the treatment or other cases of venereal diseases. Then the economic loss caused by venereal infection in the general population, on a basis of 4,000,000 incapacitated during the year, amounts to $300,000,000. It is certainly conservative to say that $2,000,000 is expended every year by people who are infected with venereal diseases on quack treatments. So that would make a total cost, including those items, of $575,000,000 a year.

Since venereal diseases, perhaps more than any other of the great plagues which scourge humanity, need a movement for a newer aspect of these two diseases, is it not incumbent upon us to utilize every effort to educate the public to a knowledge of these diseases and to their intrinsic dangers?

To control and finally eliminate these two cardinal venereal diseases, syphilis and gonorrhea, is the proper function of Public Health authorities, but to enlighten the ignorant public and arouse its consciousness to the menaces is clearly a duty of every citizen and particularly of those who are interested in the eugenist movements.

EUGENICS AS A FACTOR IN THE PREVENTION OF MENTAL DISEASE

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The burden of mental disease is each year becoming heavier. State hospitals for the insane throughout the country are overcrowded and the construction of new hospitals does not keep pace with the increase of patients. Fairly complete censuses show that the number of patients with mental disease under treatment in institutions increased from 74,028 in 1890 to 232,680 in 1920. The rate per 100,000 of population increased from 118.2 to 220.1. Careful estimates based on statistics of the New York State Hospital Commission indicate that approximately 1 out of 25 persons becomes insane at some period of life. The economic loss to the United States on account of mental disease including loss of earnings as well as the maintenance of patients is now over $200,000,000 per year. Although much of the apparent increase in the prevalence of mental disease may be due to causes which do not involve weakened resistance to the stresses of life, the load borne by the public is clearly becoming more oppressive.

Associated burdens are those of mental defect, epilepsy, dependency and delinquency. These combined cause an economic loss even greater than that caused by mental disease.

Taxpayers are groaning under excessive loads and calling in vain for relief, but their cries are faint compared with those of the persons whose relatives are mentally diseased or defective.

As less than one-fourth of those who develop psychoses can be cured by present methods of treatment we cannot hope for any permanent relief by treating patients in hospitals. The most skillful treatment should of course be given but the problem must be attacked in other ways before any adequate solution can be hoped for.

INHERITANCE OF THE NEUROPATHIC CONSTITUTION

The fact of inheritance of the neuropathic constitution may be taken for granted. Much evidence has been adduced to prove that such inheritance occurs in accordance with Mendelian laws but the subject is so complicated

that more comprehensive studies need to be made before we may consider the matter as settled. The application of skillfully devised measures of intelligence has shown us that there are many grades of intelligence between the idiot and the super-average. The so-called normals represent many types, the extremes of which are as far apart as the moron is from the low-grade normal. Recent studies of temperamental abnormalities have also revealed a wide variety of types and combinations. These abnormalities or marked peculiarities seem to be more or less dissociated from intellectual capacity. Children with super-average intelligence are frequently seclusive and morons often seem to be temperamentally normal. It becomes difficult, therefore, to establish standards of normality and to draw fixed lines between the normal and the neuropathic. This is especially true in studying family histories when judgment must be based on reports of untrained observers. Mental disease may occur in a person of almost any type of intellectual or temperamental makeup. This fact was clearly demonstrated during the recent world war. Men of strong intellect and of exceptional poise who had withstood the strain of intense warfare for several months at last succumbed when weakened by wounds and deprivation of food and drink. These were extreme cases but they illustrate the important principle that all men have limitations and may develop a psychosis or expire when their limit is reached. Psychopathic personalities give way to the common stresses of life while stronger personalities yield only to extraordinary mental strain. It is evident therefore that the whole etiology of a case of mental disease must be carefully studied before the related family stock can be safely discredited.

The data we have collected in the New York State Hospital Commission relative to the family history of patients seem to indicate that slightly more than half of our ascertained cases have no discoverable hereditary basis. If more thorough inquiries were made the proportion of patients with unfavorable family history might be increased, but the significance of the history in relation to the family stock is open to question in many cases.

In our hospitals for some years past we have studied both the intellectual and temperamental makeup of the first admissions and have tried to apply uniform standards throughout the service. In 1920 it was found that of the ascertained cases 61 per cent were temperamentally normal and 88 per cent were rated as intellectually normal. Only about 7 per cent of the patients were both temperamentally and intellectually abnormal. The proportion of patients with abnormal makeup varied considerably in the different groups of psychoses. For example, in the dementia praecox

group in 1920, 61 per cent were rated as temperamentally abnormal while in the manic-depressive group only 33 per cent were so rated.

The absence of marked abnormalities in individuals prior to the onset of the psychosis cannot be construed as conclusive evidence that there are no hereditary defects in the makeup, neither can the development of the psychosis be taken as proof of a defective constitution. All the facts in connection with the onset of the mental disorder and previous reactions must be brought together before the constitutional makeup of the patient can be positively determined.

Psychiatrists have recently emphasized the connection between bodily states and behavior and the importance of the sexual and endocrine organs in relation to the psychoses. What part of the disorders related to these organs is due to hereditary and what part to environmental factors have yet to be determined.

Notwithstanding these and many other complications, there is abundant evidence that mental disorders occur much more frequently in some family stocks than in others and that prolonged inbreeding of degenerate stocks is productive of most disastrous results.

With the limited knowledge at hand what is to be done to lessen the burdens imposed on society by the prevalence of mental disease?

Three lines of action are suggested:

1. Environmental stresses may be lessened and natural resistance strengthened.
2. Procreation of defective stock may be checked.
3. Procreation of normal stock may be increased.

LESSENING STRESSES AND STRENGTHENING RESISTANCE

The methods now in use to prevent physical disease may be applied to a considerable extent in preventing mental disease. They include the dissemination of knowledge of hygiene and sanitation, prompt treatment of incipient diseases, segregation of those suffering from contagious diseases and immunization of those liable to exposure to pathogenic germs. Another line of attack consists in safeguarding the public from injurious food and artificial beverages and from polluted air and water. The abolition of the liquor traffic and the movement to check the spread of syphilis are examples of effective work along these lines.

Economic and social stresses should be lightened for those unable to withstand them. It is far easier to relieve an overburdened man by taking part of his load than to wait until he is exhausted and then carry him together

with his burden. Physicians, parents and teachers should be alert to detect signs of mental disorder and apply the proper remedy before complete breakdown occurs.

Mental clinics and social workers are of large service in giving treatment in incipient cases. Many a case of mental disease is averted by adjusting the environment to the individual and by giving him a clear understanding of his mental difficulties and the best methods of meeting them. Wide extension of mental clinic work is clearly indicated.

The new science of mental hygiene is teaching us that individuals with unfavorable heredity may do much to overcome their constitutional tendencies and to preserve their mental health. It is of the highest importance, therefore, that mental hygiene be taught and practiced in the public schools along with physical hygiene.

CHECKING PROCREATION OF DEFECTIVE STOCK

A decade ago sterilization of defectives was widely advocated and laws making provision for it were passed in several states. These measures have availed little because they have not been supported by active public sentiment. Judging from the present outlook we can not hope that sterilization will soon be an effective means of preventing mental disease.

Segregation of the mentally defective and epileptic is the prevailing method of limiting procreation among these classes. Its eugenic value is beyond question but the enormous cost limits its application. As a rule the mental defectives and epileptics cared for in institutions are of low grade. These if left at liberty would multiply far less than those of higher grade. Much is to be hoped from the colony plan of segregating mental defectives, as colonies care for high grade defectives and under wise management become self-supporting and may be increased without limit.

A new departure has been made by the State of New York in establishing a separate institution for defective delinquents at Napanoch. This troublesome group has been a serious problem in the jails and prisons of the state and heretofore there has been no satisfactory way of dealing with them. Their segregation should have large eugenic significance.

Segregation of the insane is fairly complete but as only about one-fourth of the first admissions are under thirty years of age on admission its value in preventing procreation in this group is not as great as would appear when only the number of patients under treatment is considered. Overcrowding and the expense of maintenance cause patients to be promptly released on improvement of their mental condition regardless of the eugenic factors involved.

Something can be done to lessen reproduction among the unfit by enlightened public sentiment and by better marriage laws. Marriage of persons with marked intellectual or temperamental abnormalities should be entirely prohibited.

To prevent the marriage of normal persons with those carrying a neuropathic taint more knowledge of family stocks must be made available. At the present time genealogical records of the average family are woefully meager and comparatively few are available for public inspection. If we are to improve the race by better marriages genealogical or eugenic bureaus must be established in cities and villages. Data concerning family stocks should show the defects as well as the excellencies and achievements of the individuals recorded and be available to interested parties.

Love is proverbially blind but few normal persons would be rash enough knowingly to join fortunes with a neuropathic or degenerate family stock. Unfortunately very little thought is now given to the eugenic significance of marriage and few signs warn impetuous youth of the danger ahead.

INCREASING PROCREATION OF NORMAL STOCK

Eugenic bureaus by collecting data concerning family histories and by emphasizing the importance of family stock would naturally promote marriages among persons of good stock and thereby increase procreation of a desirable kind. The increase of good stock would raise the general level of the race even if there were no decrease of poor stock, but we may safely assume that more definite knowledge would gradually lessen reproduction among the unfit.

The elimination of mental defects and diseases is after all principally a matter of education. We must learn by careful research what should be done and what should not be done and then disseminate the information so that it would be shared by every household. Action will slowly follow knowledge but ultimately a more perfect race will be evolved.

MEDICINE'S OPPORTUNITY

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Man has a sentimental, but not very intelligent interest in promoting his own well-being. His casual methods of deciding what problems are of vital importance may illustrate the compelling power of feeling but are without logical thought. He may hark upon the extravagant waste in political life, and yet his own reckless extravagance is reflected in his attitude towards the conservation of this country's natural resources. It is only after a large part of the nation's supply has been exhausted that we have made dramatic and sometimes almost futile efforts to repair the damage done.

We are familar with the campaigns organized in recent decades to conserve and protect what remains of the supplies nature lavishly provided us; but that waste, stupid as it was, cannot be compared with the shameful wastage of the nation's brains. Although the enormous loss of life incurred during the War, and the complicated civilization man has evolved are distinct menaces to the brain power of the world, little is being done to conserve the splendid functions of that organ, the brain, which has raised man to his present superior position in the animal kingdom.

Mental diseases, distinct psychoses, have resulted not only in waging war, and have brought untold suffering to mankind, but have also led to delirious outbursts of Bolshevism. While during the period of the War commendable efforts were made to organize the brain-power to win a military victory, no efforts on a commensurate scale have, since peace was declared, been made to organize brain-power with a view either to the study of the psychoses that swept over Europe during the War with its aftermath of devastated Russia, or to the search for methods necessary for the establishment of a permanent peace. Slowly by reason of exhaustion we have drifted into peace, but who believes that we have reached this goal because of some organized effort?

Although there is no possible doubt that at the present moment it would be a fine indication of sanity were every bit of available brain-power concentrated on the preservation of peace among the nations—the great prob-

lem of our time—comparatively few persons, including physicians, are making any intelligent efforts to learn how to use the brain power to the best advantage in securing the rational thought and action necessary to the conservation of that peace.

It is singularly unfortunate that even the physician does not as yet grasp the idea that he is in an advantageous position to study the influences that actuate the thinker and determine the processes of his thought. Should the physician firmly grasp this fact and avail himself of his opportunity he could make valuable contributions to the problem's solution, by laying bare many of the factors responsible for the fallibility of thought and the causes of errors, by analysing the illusions, and the amazing failures in living that confront us on every hand, and so be prepared to assist in making man worthier of his assumed title, Homo sapiens.

The physician's method must be the first step—and a very important one—in understanding the body-mind organization. But physicians unfortunately do not know that just as there is a special technique for investigating the circulation of the blood, or the secretions of the glands, there are also special methods for analyzing feeling, for tracing the genesis and significance of thoughts and for unearthing the source and nature of impulses and motives of behavior. Physicians have been trained almost entirely in the use of analytical methods, and therefore do not appreciate the great importance of synthetic methods of investigation. Of what value are the analytical methods of study, of investigation of the functions of the various organs, if we fail to take into account the interaction of all these functions and their expression in behavior, together with the attempts to adjust life to the environment?

In every medical school there should be departments for the study of human behavior, which is the machine in action. Physicians should be encouraged to believe that it is fully as important for them to watch the human machine running along life's highway, to note its difficulties in climbing, in encountering obstacles, and to remark its control, or lack of control, when rushing through life, as it is to be present in the shop, or office, when it is undergoing repairs. It is only from experience gained from watching the human machine in action that we can judge what the undesirable qualities are that should be eliminated and what the good ones are that deserve encouragement and continuance through future generations.

Today we approach the problems of Eugenics largely as amateurs with little or no experience in studying the human animal in action. Recently we have been thoroughly impressed with the importance of eliminating the unfit, but how much attention has been given to the assistance of the *fit*

toward the full stature of their development? It would seem that civilization is being so held back by those with a Prohibition attitude toward life that comparatively little effort is being made to find out the nature of the constructive forces in the individual, and by what means these progressive forces may be strengthened and given opportunity for self expression.

Physicians could easily be trained in departments of human behavior to take a wider intelligent interest in human problems. It would be possible to give those interested in the problems of eugenics some chance to acquire the methods and technique of studying the personality; and in addition to the aquisition of methods for the detection of unfitness, the knowledge of how fitness and the qualities necessary for the development of our civilization may be recognized.

We do not believe it an idle dream that the time is not very distant when our law makers and statesman will realize the necessity of learning something about the nature of the forces controlling human beings. Then clinics for the study of human behavior will be frequented not only by medical students and those interested in the problems of eugenics and social welfare, but by every person who has an intelligent interest in learning how to control and to direct the energy of human endeavors.

THE MORPHOLOGIC CHARACTERISTICS OF PSYCHONEUROSES

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One of the most difficult problems by which neurologists and psychologists are confronted today is undoubtedly the one related to the interpretation of the psychoneuroses.

The solution of this problem is of paramount social importance inasmuch as the number of psychoneurotics seems to increase every day more favored by factors which a popular prejudice considers as the product of civilization.

The old Latin dictum "mens sana in corpore sano" indicates how much our ancestors were aware of the influence exerted by the body over the functions of the mind. This influence is not denied today; however, it must be admitted that in the interpretation of the abnormal psychic phenomena of the psychoneurotic, too much stress is usually laid upon the mind and too often the question of our somatic individuality is either neglected or little considered.

In fact, the many theories advanced in explanation of the etiology of the psychoneuroses are considered almost entirely from the psychological point of view. Only during the first part of the war the "commotional" or "organic" theory of the psychoneuroses was brought forward and gained for some time quite a number of followers, among whom were Ravaut, Souques, Guillain, Léríche, Mégewand, Sollier, Mott, Segaloff, Harzbecker, Arnaut and many others. However, this theory was found to be too radical and ought to be discarded, a fate common to almost all the one-sided theories and doctrines.

The physical element as etiological factor in psychoneuroses is now more often called into play. Dana (1) deplores the emphasis placed on the psyche as the sole etiological factor in the psychoneuroses. Strecker (2) has found definite organic diseases in 46.1 per cent of his 250 cases of neurasthenia, psychasthenia, anxiety neuroses and hysteria, and considers these findings quite significant to be interpreted as a mere accidental concomitance.

Recently the study of the endocrine glands has cast a new light on the mechanism of the functional nervous disorders. This better insight gained

in such a complex subject has been made possible by a broader and deeper understanding of the problem of constitutions and temperaments.

The genial conception of De Giovanni (3), the founder of clinical morphology, who, fifty years ago, emphasized the importance of the constitutional somatic anomalies in the derangement of the central and autonomic nervous system, has been of far reaching consequence. For De Giovanni there were not so many neuroses, but a nervous diathesis which can exhibit many clinical forms as the result of a special constitutional organization. The neuroses, he said, may be originally cerebral and react upon the spinal cord or upon the sympathetic system, or they may be spinal and become diffused through the brain and the vegetative system, or else they may originate in the sympathetic ganglia and spread to the cerebro-spinal axis. There is a vast difference, therefore, in the clinical phenomena. He called the attention to the fact that the individuals belonging to his third morphologic category are predisposed to certain derangements of the nervous system. The conception of De Giovanni has been followed and developed by his pupils, especially by Viola, who made the most complete and scientific morphologic study of an ethnic group and formulated a law of correlation of the individual types.

Viola (4), after an anthropologic study of 400 subjects of Northern Italy distinguished three morphologic types which he named *macrosplanchnic* or *megalosplanchnic*, *microsplanchnic* and *normosplanchnic*.

Macrosplanchnic and *microsplanchnic* are two opposite types. The first corresponds to the *habitus apoplecticus* of the ancient physicians, to the third morphologic combination of De Giovanni and to the second constitutional anomaly of Beneke; this is a *brachymorph type*; the second (microsplanchnic) corresponds to the *habitus phthisicus*, to the first morphologic combination of De Giovanni and to the first constitutional anomaly of Beneke; this is a *dolichomorph type*.

Macrosplanchnics or *megalosplanchnics* are individuals possessing a large trunk which is excessively developed in relation to the limbs; that is, the horizontal diameters are prominent in comparison with the vertical diameters in the body as a whole and in its constituents, trunk, extremities and portions of the extremities.

Microsplanchnics are individuals possessing a small trunk so that the development of the limbs is in excess over it, in the sense that the vertical diameters predominate over the horizontal diameters in the body as a whole and in its constituents, trunk, extremities and portions of the extremities.

Between these two opposite types are the *normosplanchnic* types who represent individuals in which trunk and limbs show a harmonious develop-

ment, inasmuch as neither one, when the numerical value of each is taken, predominates over the other; that is, there exists a constant proportional relation between the horizontal and the vertical diameters of the body.

When we compare these types, from the standpoint of their functional activities we find that in microsplanchnics the functions of the life of relation are in excess over the functions of the vegetative life. The opposite is true of the macrosplanchnics, whereas in the normosplanchnics a harmonious correspondence exists between the opposite functions. The trunk, as Viola observes, contains the organs of the vegetative life, which represent the nutritional system. These organs fulfill a task entirely different from the muscular and nervous system and skeleton, which constitute the system of relation, or the system that mediates contact with the external world.

These two systems show a certain degree of independence and even antagonism during the development in the sense that they do not grow simultaneously, but in alternate phases; and the more an organism develops the system of relation, the less it develops the vegetative system, when considered in relation to their reciprocal dependence.

Following the anthropologic method of Viola in estimating the volume of the trunk, we demonstrated, with the analysis of more than 600 college students, that a positive correlation exists between the morphologic index or the ratio of height to weight, and intelligence.

The morphologic index which we used was obtained by dividing the length value of one upper and one lower extremity by the volumetric value of the trunk.

Full description of the method and the results are partly given in one of our monographs (5) and in another paper which is still awaiting publication.

The scope of the research which forms the subject of this communication was to determine whether the morphologic characteristics of a given group of psychoneurotics, are substantially different from those of an equal group of normal subjects.

This investigation carried out on a group of 100 Italian male psychoneurotics from the age of twenty-five to thirty-five had shown that:

a. The combined percentage of microsplanchnic and macrosplanchnic types is higher in a group of psychoneurotics than in an equal group of normal individuals of the same age. The percentage of normosplanchnics is lower in a group of psychoneurotics when this is compared with an equal group of normal subjects of the same age and sex.

b. A group of neurasthenics seems to give more microsplanchnics than a group of normal subjects and even more than a group of emotional psychoneurotics. A group of emotional psychoneurotics seems to give more

macrosplanchnics than a group of normal individuals and still more than a group of neurasthenics.

These preliminary findings bring support to our view that the soil of the psychoneuroses is prepared by complex endogenous factors, which may appear externally under the aspect of morphologic disharmonies taking place within the organism during its prenatal life and during the period of its development. Both the morphologic defects and the neurotic constitution have the same genetic basis. The action of manifold internal or external factors, such as primary diseases or irritative states of the internal organs and sense organs, emotions or protracted emotional states, exhausting physiological and pathological conditions, endogenous and exogenous intoxications, physical and mental strain, etc., if exerted on organisms presenting such morphologic soil, will produce irritative states of the endocrinosympathetic system, which, propagated to the central nervous system, will interfere with the full and normal extrinsication of the psychic personality. Therefore the psychoneuroses, with probably few exceptions, are constitutional conditions, the organism being congenitally predisposed toward one or another type of neuroses. These neurotic diatheses are the expression either of a defective or of an excessive make-up of the sympathetic-endocrine system. On one side we have the dolichomorphs (microsplanchnic) with congenitally defective organic functions, on the other we have the brachymorphs (macrosplanchnic) with a congenital excessive nutritional system. In the first, as it was pointed out, the system of the life of relation predominates over the system of nutritional or vegetative life; in the second, the system of nutrition predominates over the poorly developed system of relation. The microsplanchnic is a candidate for the asthenic forms of psychoneuroses because of his deficient muscular development secondary to poor organic functions. In these individuals the catabolic processes predominate over the anabolic processes, and this is the primary cause of fatigue which will gradually lead him toward the asthenic syndromes, whenever given external factors, psychic or physical, come into play. The opposite is true of the macrosplanchnic in whom the anabolic processes are in excess over the catabolic ones. This type, like the infant whom he morphologically resembles, being more vegetative than the opposite type, will quite often be guided by instincts and emotions in his relationship with the external world. In both these types there is a state of disharmony between the two great systems, whose perfect balance is the essential factor for the function of a normal personality.

It is known that the psychoneuroses appear at puberty or after, namely, in periods of the greatest organic exigencies of the organism, when the endo-

crine glands undergo profound and rapid functional changes and when the contact of the organism with the external world is more intimate and more exacting.

Emotional syndromes are often found among the intellectual inferiors, infantile and senile types, uneducated individuals, in whom every emotion finds an outlet through instinctive egotistic reactions. These infantile and inferior types are phylogenetically and ontogenetically behind development. Their mental hypo-evolution makes them more akin to vegetative organisms, whose actions are reflex-like. It is the vegetative system and the basal ganglia and the spinal cord that govern the actions of the intellectual inferiors, more than the cortex. One would say that during ontogenesis, the will did not develop in an adequate manner as to moderate the reactions of the instinctive life. Everybody knows that a superior will is the gift of a superior mind, of a well organized psychic personality, capable of dominating the emotions and of commanding or silencing their external display at the proper time.

The limited amount of inhibition exerted by the brain centers over the emotions accounts for the dominancy of the latter over the "critique" whenever a situation arises which calls for instinctive reactions. The suggestibility of the hysteric patients is merely a consequence of the high emotional threshold they possess.

Not so with the microsplanchnics. In these individuals the emotional threshold is rather low. Even in the case of strong stimuli acting from the inside or from the outside, the greater inhibition exerted by the brain, will, in many instances, either suppress or maintain within restricted limits the emotional reaction. Probably this is one of the reasons why the sexual sphere is often functionally impaired in neurasthenics. In fact, it is known that the sexual life requires freedom from any introspective analysis of the mind in order to extrinsicate itself fully.

Our results, examined in the light of our previous researches, are in accord with the findings of Hollingworth, namely, that neurasthenics are more intelligent than hysterics.

From what has been said, it is clear that we have classified the psychoneuroses in two groups, the emotional and the asthenic. Among the emotional psychoneuroses we included hysteria, anxiety neuroses, most of the traumatic neurosis and some atypical forms which suggest a primary disturbance of the emotional sphere; among the asthenic psychoneuroses are neurasthenia and the allied constitutional syndromes in which asthenia is the predominant symptom.

One might observe that neurasthenia is also to a certain extent an emotional psychoneuroses.

Without denying the importance of emotions in the fixation and duration of the neurasthenic symptoms, yet we do not consider them to be directly connected with emotional experiences as in the case of hysteria.

We cannot accept the too radical view of Babinsky about hysteria. Emotional factors are too closely connected with hysteric manifestations to deny their causal importance. On the other hand, too many are the clinical experiences which confirm the existence of a morbid entity called hysteria, whose symptomatology cannot be reduced to a process of mere imitation and suggestion (pithyatism).

Against this too radical view of the eminent French neurologist are the opinions of famous neurologists and clinicians, such as Déjérine, Raymond, Janet, Claude, Sollier, Oppenheim, Strümpell, Kraepelin, Bleuler, DeSanctis, Murri, Tamburini, Tanzi, Bianchi, etc., who believed or believe in the emotional nature of the syndrome. Any clinician who observes hysterical patients will find that the hysterical symptoms followed an emotion more or less severe.

Of course it is not to be expected that the same emotion will cause the same reaction in different individuals. Will the megalosplanchnic types who, because their system of nutritional life is congenitally predominant over the system of relation, become the easy prey of the emotions?

Anxiety neurosis enters in the same category as hysteria, because it represents a syndrome which has the same basis, although induced with a different mechanism. In other words, in hysteria we have a syndrome which is occasioned by an external factor, viz., an emotion; in anxiety neurosis, instead, we have a disease which is characteristic of an altered protracted emotional state induced by internal factors, usually states of dysfunction of any one of the internal organs which are under the dependence of the sympathetic. In both cases a disorder of the endocrine-sympathetic system exists which alters the emotional mechanism.

So the two syndromes are the same except that they originate in a reverse order and show different intensity of symptoms.

In the same group of emotional psychoneuroses we include all the other unclassified syndromes, which the general physician so frequently meets in his daily practice. These are characterized by manifold symptoms, such as general pain, headache, dizziness, parasthesias, tinnitus aurium, digestive and vasomotor disorders, anorexia, insomnia, abnormal cenesthesic sensations, exaggerated emotional display and by many other indefinite sensa-

tions suggestive of metabolic and endocrine disorders, but without the existence of asthenia as predominant feature.

In the different clinics and hospitals the patients presenting this multiple and complex symptomatology are either classified among the categories of hysteria, psychoneurosis, neurotic constitution; or among the group of toxemia, the symptoms being interpreted as due either to intoxication from teeth (thank God the fanaticism for wholesale teeth extraction is waning), infected tonsils, sinuses, ears, the alimentary tract; or to hypothetic diseases of the stomach, liver and other internal organs, to appendicitis, to uterine disorders, to thyroid, ovarian, suprarenal dysfunction, or even to rheumatism, according to the criterium of the examining physician and the tendency of his school. This type of patient, seems to me, is too frequently met, and the symptoms are too many and too diffuse to be attributable to the derangement of a single organ. On the other hand, they show neither a picture of hysteria nor that of neurasthenia.

Therefore, a special class should be made for them.

Of course we do not deny that in many such cases, real diseases of the ear, nose, stomach, etc., exist which are the cause of the nervous symptoms, but our clinical experience very often shows that physicians mistake symptoms of irritative nature for organic diseases and that surgeons operate on symptoms. We believe that in such patients with so many different symptoms and without definite signs of a localizable internal organic disease, a disturbance of the sympathetic nervous system must cause states of dysfunction of the different internal organs and thus alter the emotional life as well as the metabolism. Such states of dysfunction will, of course, terminate in real organic diseases, if not corrected in time, because of structural changes that any protracted irritation of the nervous apparatus induce in the organs of its distribution. The causes for sympathetic derangements are connected with many external factors such as the system of life of the patient, diet, occupation, hygiene, economic status, domestic difficulties; but the patients are predisposed by a morphologic diathesis. A diathesis represents a borderline condition between physiology and pathology. The maladjustment to the environment and the abnormal reaction to the same difficulties which other people were able to overcome, have thus, very often a basis in some constitutional factors appearing to us as morphologic defects of the patients, which in reality indicate diseased conditions in a latent or incubatory state.

We have not considered the psychasthenics in this study, because psychasthenia in the broad sense given by Raymond and Janet, comprehends some syndromes which, we think, belong rather to the group of insanities.

Systematized obsessive states, in our opinion, should not be considered with the psychoneuroses, but should be classed under the original names of *obsessive psychosis, psychosis with compulsive or imperative ideas,* or *rudimentary paranoia,* as suggested by Morselli and Arndt, because such states, characterized by embryonic abortive delusions, are the expression of a constitutional psychic morbidity having deep and complex roots in the inner structure of the brain rather than in somatic disturbances, or in environmental difficulties, nor can they be occasioned by accidental factors.

The morphologic type shown by the neurasthenic partakes of the characteristics of the asthenic type of Stiler, phthisic habitus of Viola, Addisonian habitus of Pende, hypoplasic constitution of Bartels. This type is encountered among the neurasthenics as well as among tuberculous subjects.

Why is it that the tuberculous patient shows so often the neurasthenic syndrome? Many are the opinions on this regard. Some authors believe that the nervous symptoms are due directly to the tuberculous toxins, but this opinion cannot be accepted, first, because neurasthenia appears many times several years before tuberculosis sets in, in predisposed individuals, and secondly, because the nervous symptoms do not grow with the progress of the disease. The many ingenious psychological theories explain the nervous phenomenon only in part. Undoubtedly the mental set of the tuberculous patient, who is forced to contemplate his doom, plays a great rôle in the fixations of the nervous symptoms, but we think the physical constitutional element is to be primarily considered. We agree with Ichok (6) that the organic impairment is the primary factor, all other factors may supervene as secondary in the course of the disease.

The tuberculous patient is predisposed toward neurasthenia as he is for tuberculosis, namely, he has in his morphologic type the latent organic cause of his disease. The Koch bacillus is but one of the means by which nature gets rid of the abnormally constituted individuals unfit for the race. The tuberculous patients are usually microsplanchnics and extreme microsplanchnics. It is generally known that they are rather intelligent individuals. Owing to the deficient development of their muscular system, they do not indulge in athletic exercises and acquire a greater transport for the aesthetic side of life. It is the easy muscular fatigue and the deficient organic functions that bring this type to react in that peculiar clinical picture met with in neurasthenics. That hysteria may be found among tuberculous subjects is certainly a fact, however our experience and our inquiries in sanatoria for tuberculosis are to the effect that cases of hysteria are rather few among tuberculous subjects when compared with the great many cases of neurasthenia.

Of course it would be absurd to assume that neurasthenics are expected to be found only among the microsplanchnics and hysterics only among the macrosplanchnics. We do not say that all dolichomorphs will become neurasthenic and that all brachymorphs will become hysteric. Any one of the different morphologic types is found among emotional as well as asthenic psychoneurotics. What we want to bring forward here is the morphologic diathesis which plays such an important rôle in the mental as well as the physical disorders. This morphological element is usually completely disregarded today by observers of normal and abnormal mental states. We maintain that other things being equal, the response of an individual to external and internal situations (emotions, diseases, intoxications, etc.) may, to a certain extent and within the limits permitted by the hereditary laws, be anticipated by his morphologic type. In laying emphasis on the morphologic anomalies we keep in mind heredity as the primary factor in all nervous manifestations. The morphologic types themselves are governed by the laws of heredity. Nervous and mental diseases, alcoholism and all kinds of intoxications and infections in the ancestors and parents, especially those contracted during the period of pregnancy, having a direct bearing on the structure of the nervous system of the offspring. In these cases the abnormal behavior of the organism has, as primary etiological factor, the abnormal constitution of the nervous system. But, in the same manner that modifications occur in the structure of the nervous system, the same hereditary factors will induce more or less marked changes in the endocrines, which will, later on, come to the surface as morphologic anomalies of the body.

Mind as well as body is shaped before the individual has attained its full physical development. Hormonic disorders are responsible for both the physical and mental deviations taking place during the period of development; therefore we may get some insight in the mental make-up of the patient by an accurate morphologic study. The proper consideration of the morphologic anomalies and a better interpretation of their significance will be of great help to the physician in the diagnosis and treatment of the functional mental illnesses. Lombroso's conception in its essence was founded on a morphologic basis. In this respect we do not see any weakness in the main point brought forward by the Italian scientist, although we admit that his theories were extended too far by fanatic followers looking for too hasty practical conclusions.

Summing up the result of this preliminary study has shown that well built individuals (eumorph types) namely, those whose organs and systems are proportionately developed, are less subject to psychoneuroses than the

other individuals in whom a certain disproportion exists among the different parts of the body. The latter, who possess morphologic disharmonies, in excess or in defect, present also in special manner that neurotic diathesis which is responsible for their diminished degree of resistance to the physical and psychic surmenage of life.

To promote a proportionate morphogenesis by improving the morphologic characters of the race, and by correcting the morphologic disharmonies of the individual during the period of development, is a problem of mental hygiene which eugenists must earnestly consider.

We must reduce the number of extreme macrosplanchnic and extreme microsplanchnic subjects if we want to improve, together with the qualities of the body, the qualities of the mind.

This end may be accomplished:

1. By avoiding marriages between two individuals possessing the same morphologic defect or excess, such as between two extreme macrosplanchnics and between two extreme microsplanchnics. Nature has provided man with some inborn attractions or repulsions, sympathies and antipathies which seem to be directed toward this end.

2. By correcting during infancy and childhood such states of partial or total hypo-evolution and hyper-evolution of the soma which the study of the physiologic age of the subjects may reveal. The correction of such evolutional deviations will be accomplished, within the limits permitted by the laws of heredity, through a better understanding of the means to treat the disturbances of the endocrine glands. Morphologic anomalies are usually the expression of morbid conditions and of states of dysfunction of the endocrine glands during the prenatal life and during the period of development of the organism, and should be given attention at the proper time, because they are accompanied by nervous anomalies.

3. By keeping these abnormal morphologic types away from such occupations and experiences which require physical over-exertion in the case of microsplanchnics and emotional strain in the case of macrosplanchnics.

Had this precaution been taken during the last world conflict, in connection with the measurement of intelligence of the recruits, the number of the so-called "functionally disabled" might have been eventually reduced.

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ENDOCRINES, DEFECTIVE GERM-PLASM, AND HEREDITARY DEFECTIVENESS

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Frankly, the purpose of this paper is to call the attention of the biologists and geneticists here assembled to the great dearth of practical knowledge in the realms of medicine regarding the rôle of hormones—those secretions of the so-called ductless glands or endocrine system.

Clinical experience in the use of these substances has been highly unsatisfactory up to the present time, and results are in many cases even apparently contradictory. The discussion of endocrine therapy in a medical convention usually resolves itself down to a matter, largely, of personal opinion.

In my effort to secure the consensus of opinion in this country regarding endocrines, I estimated that there were approximately about one thousand persons whose opinions and experience it would be helpful to know, and whose suggestions might be valuable in reference to future research. Accordingly I prepared ten questions which I sent out in the form of a questionnaire to the representative zoölogists, biologists, geneticists, eugenists, neurologists, psychiatrists, as well as educators and others having large contact with the feebleminded, defective and delinquent classes.

The tabulation of the answers to this questionnaire is sufficient to show the chaotic state of both opinion and information regarding various phases of ductless gland knowledge in this country at the present time.

Question 1. Do you hold an opinion that certain forms of hereditary physical and mental defects may possibly be due to endocrine abnormalities, as well as direct defectiveness of the germ-plasm? Do you think it possible that deficiencies in the ductless gland system or internal secretions of the pregnant mother could contribute, directly or indirectly, to either mental or physical defectiveness or retardation in the offspring?

Seventy-four per cent of those replying believed that endocrine disturbances in the mother were responsible for hereditary defectiveness. Three per cent held that such defects were only due to defective germ-plasm, while 23 per cent were noncommittal, or declined to offer an opinion in answer to this query.

It seems to be the consensus of opinion that the ductless gland system has something to do with coördinating and otherwise influencing growth and development. There is large opinion to the effect that both pre- and post-natal development are regulated largely by the stimulus of the thyroid gland, which in earlier months is held in check by the thymus, the lymphatics, and perhaps the pineal gland. Later on the adrenal system becomes active, influencing more specifically the muscular, skeletal and sexual systems, while the pituitary body is thought to stimulate every organ of the body. It seems to be the opinion that this endocrine system, which is at first so largely concerned with bodily development, subsequently exercises an equally powerful influence on psychic development and behavior.

Without going into the old superstition of prenatal influence, maternal culture, birthmarks, etc., there seems to be a general belief in the fact that dysfunction in the maternal endocrine system can influence the foetus. Many cited the case of the man six feet two inches tall, who married a woman of diabetic tendency, from which union came three apparently normal daughters whose progeny exhibited exophthalmic goitre, hare lip, chalky degeneration of the teeth, diabetes, blindness, sarcoma, hyperpituitarism, osteomalasia, and acromegaly. In commenting on this case, Timme says:

> In tracing the progeny of the original family through three generations we find certain characteristics transmitted, which, in the light of present knowledge, we may assume to be due to disturbed function of the endocrine glands.

Dr. Tucker, of Richmond, reported to me a case of

> Pituitary tumor with acromegaly, of whom the mother had acromegaly, and one of the children had hyperpituitarism to such an extent that she menstruated at the age of two years and was precocious in other respects.

> *Question 2.* Do you think feeblemindedness is in any way associated with disturbances in the ductless gland system of the individual?

Fifty per cent believe that feeblemindedness is always more or less associated with endocrine disturbance. Five per cent think not, believing the defectiveness to be entirely a matter of the germ-plasm. Forty-five per cent were either noncommittal, or else so equivocal that we regarded the reply as noncommittal.

Dr. Raeder, of Boston, in a careful examination of one hundred defectives both clinically and post mortem, found that there was a demonstrable gland change of one sort or another in 74 per cent of cases, with marked gland changes in 21 per cent; while Castex of Buenos Ayres thinks that:

"The stigmata of hereditary syphilis are in large part due to thyroid dystrophy," and further, he believes that: "Mongolism is a dystrophy of endocrine origin produced by syphilis."

Concerning the matter of inherited defectiveness, Sajous thinks that

> There is thus a solid foundation for my belief that what in reality a mentally defective child inherits from his parents and ancestry is: (1) a tendency to defective physiological nutrition and development of his cerebral neurons; (2) inability to break down adequately various endogenous toxics, capable of awakening active psychical disorders; and (3) that both these morbid conditions are traceable back to the degenerative disorders caused in the ductless glands of parents or ancestors by the diseases and intoxications known to lead to the genesis of mentally defective offspring. Briefly, *the main underlying cause of defective mentality in both parent and offspring is inherited deficient activity of the ductless glands*. Under these conditions a pregnant defective fails to supply her fetus with the ductless gland secretions it requires. If the father is also a defective we know that the product of conception, when developed, will prove to be a defective.

As to the pituitary, it was found to be overactive during pregnancy by Compte, Launois and Mulon, and others. Swale Vincent states, in fact, that it may enlarge to two or three times its normal size. The thyroid is so active also that its enlargement is often noticeable—108 times in 133 cases of pregnancy studied by Lang. If deficiency of thyroid is present convulsions occur, but these may be arrested by administering thyroid gland. Disorders of the pituitary also give rise to psychosis. As stated by Cushing, referring to his cases, and quite in accord with my own observations, "One form or another of psychic irregularities have manifested themselves in the larger number of patients."

One authority thinks that the thymus is so important an organ in this connection that it may be said to stand, in respect to idiocy and dementia praecox, as the thyroid does to myxedema and cretinism. So evident is this connection that Bourneville found the thymus absent in twenty-eight idiotic children examined post mortem, while the organ was found normal in sixty-one children of normal mentality, who died of various diseases.

Sajous believes that many of our mental and nervous defectives are "functional defectives"—not organic defectives; and he further states the case as follows:

> The thousands of purely functional defectives which the country contains, as we have seen, are not, judging from personal cases, the children of parents in whom in most instances, clearly defined stigmata can be discerned. This means that any infant may become a defective unless its development is closely watched by the attending physician. At the present time the evil trend is discovered too late to save the child's mind.

Question 3. Do you think it possible that certain forms of backwardness may be due to disturbances of internal secretions, rather than directly the result of defect in the germ-plasm?

Seventy-eight per cent of our replies indicate a belief that certain forms of backwardness are more likely due to endocrine disturbances than to defective germ-plasm. Only 1 per cent answer this question in the negative, while 21 per cent are noncommittal or offer otherwise unsatisfactory answers. Many of the physicians and some of the biologists replying are of the opinion that it is more or less impossible to distinguish between these two possible causes of defectiveness. Others feel that the retards and subnormals who develop up to a certain point, are abnormal more largely as the result of exclusive defect of the germ-plasm, while some of the educators seem to lean toward the opinion that those dullards or backward children who do not stop definitely at a certain point in their mental progress, but who are able to go on farther in school—though with greater difficulty—it is their belief that in the case of these so-called "backward children" the endocrine system is more largely at fault, and that the backwardness is not due wholly to hereditary defect in the parental germ-plasm.

McCord and Haynes are inclined to believe that endocrinopathies arising from environmental conditions—scarlet fever, syphilis, etc.,—may recur in the offspring. Such a belief might offer in its support Guyer's more recent experiments, suggesting that the internal secretory system may be a factor, after all, in modifying the mechanism of inheritance; and if this is true such a fact would be of far reaching significance to both medicine and practical eugenics. It should be noted in this connection that McCord has demonstrated a functioning of the pituitary and suprarenal glands within the second month of fetal life, and maintains that development of these fetal endocrine glands is influenced by the glandular system of the mother.

He demonstrated that thyroid gland tissue added to the living water of frog tadpoles brought about the transformation from the tadpole stage in one week, instead of three to five months, whereas thymus tissue added to the living water of tadpoles retards the differentiation.

One-fifth (21.1 per cent) of 1134 feebleminded inmates examined in the Michigan Home and Training School presented characteristics of glandular defects, and led to the conclusion that heredity was the foremost factor in their etiology. It was believed that while "the glandular disturbance may increase the defect, more often the co-existing feeblemindedness and glandular defect are the outcome of the common hereditary cause."

Question 4. Do you think Mongolian idiocy is entirely due to thyroid or endocrine disturbance, and not also to defective germ-plasm?

Ten per cent of the authorities consulted believe that Mongolian idiocy is entirely due to thyroid or other endocrine disturbance; 27 per cent think not; 63 per cent failed to express an opinion.

Question 5. Concerning dementia praecox, do you believe that it is entirely due to defective germ-plasm? To abnormalities of the endocrine system? Or to both causes?

Thirteen per cent believe that dementia praecox is entirely due to defective germ-plasm, 22 per cent that it is entirely due to abnormalities of the endocrine system, 3 per cent that it is due to both causes, while 62 per cent were entirely noncommittal in their answers, or offered such a wide range of novel theories as to leave their conclusion in the uncertain or noncommittal group.

Dr. Tucker, of Richmond, says:

> There seem to be definite reasons for believing that pituitary adolescent psychoses exist, that these psychoses may be divided into groups according to adolescent symptoms, that the X-ray findings correspond with the clinical type of the case, and that in cases which show decreased pituitary secretions the response to pituitary feeding is prompt and satisfactory.

Many authorities believe that dementia praecox is a symptom complex, that like epilepsy it comprises a dozen or more types of involvement, while other authorities hold with Lessing of Berlin, that dementia praecox is a disorder due to polyglandular endocrine disturbance. Lessing even holds that the tendency of praecox victims to early acquired tuberculosis is due to endocrine disturbance. This authority claims that the injection of adrenalin in praecox cases does not increase blood pressure—at least in 50 per cent of the cases no effect was observed from the injection of 1 cm. of a 1:1000 solution. In the other 50 per cent the blood pressure was lowered. A number claim to have gotten favorable effects in certain types of dementia praecox by the administration of thyroid gland. Personally, I have never been able to get these favorable results.

Sajous thinks dementia praecox is partly caused by decreased secretion of the thymus gland too early at puberty, that is

> Before the completion of the development of the brain. The thymus being also a participant in the antitoxic processes of the body, with the thyroid and adrenals, its untimely deficiency entails likewise the accumulation of toxins which produce the morbid mental phenomena. Kraepelin, Tyron and Pierce Clark, Benedik and Deak, Laignel-Lavastine, and others, have held that the disease was of toxic origin—again, however, without accounting for the process.

Question 6. Have you seen any beneficial results in any case of hereditary defectiveness, as the result of the therapeutic administration of the ductless gland products? If so, what class of disorder was benefited? What gland substance was used?

When it comes to the discussion of ductless gland therapy, we are confronted with confusion worse confounded. The only note of optimism

seems to come from the manufacturers and agents who have these substances for sale. Its practical use in the average run of cases is highly disappointing. Forty per cent of our replies, however, answered that they had seen beneficial results in various cases of hereditary defectiveness from the use of numerous ductless gland substances. Thirty-six per cent reported pessimistically and discouragingly, or that they have had only negative results, whereas 24 per cent had had no experience or it was so uncertain and limited as to lead to a noncommittal reply.

Extensive experiments made in the Michigan Home and Training School led to the conclusion that the promiscuous employment of glandular treatment for hereditary defectiveness was a failure except in borderline cases with mild mental inaccuracy.

Wagner reports, in an extensive, well-controlled experiment in the Vineland institution, in which pineal gland extract was fed to twenty-seven mentally deficient children over a considerable period of time, that while the results were mildly suggestive of a positive reaction; "On the whole the findings were little different from those in the control group," and that author concludes that the substance of the pineal gland is entirely inert.

In my own practice there have been many very encouraging cases—remarkable improvement resulting from glandular therapy; but on the whole, my experience has been disappointing.

Question 7. Do you believe it would be possible for the ductless gland secretions circulating in the blood of either father or mother to in any way permanently affect the germplasm so as to result in the transmission of some defect or abnormality in this way acquired or induced? (As possibly suggested by Guyer's experiments in transmitting eye defects in the case of rabbits.)

One-half of our answers came back, "Yes," to this question. That is, 50 per cent of those consulted hold the opinion that it is possible for hormones circulating in the blood of either father or mother permanently to affect the germ-plasm so as to result in the transmission of some defect to the offspring. Five per cent believe emphatically that this could not be the case, while 45 per cent are non-committal, although the majority express great interest in the work of Professor Guyer but think that work of this kind needs further confirmation. Of course, many hold that endocrine disturbance in the mother can affect the offspring, even though they do not believe that such chemical agents can affect the sperm of the father so as to influence heredity, as suggested by Guyer's work.

Many opinions in this line seem to have been influenced by the work of Professor Lillie, at the University of Chicago, in his experiments having to

do with the freemartin which are probably familiar to all, and in which he showed the influence during prenatal life of the circulation of the sex hormones.

Many authorities hold, with Dr. Wright of the Bureau of Animal Industry, that Guyer's work suggests

> The possibility of causing hereditary changes of a more specific kind than mere injury by a poison. If antibodies can produce specific heritable changes in the germ-plasm, there seems no good reason why the endocrine hormones should not do so.

Question 8. From the cases observed, do you believe that we have such substances as the so-called "racial poisons?" (That is, that alcohol, syphilitic toxins, etc., can alter the germ-plasm, and thus permanently influence heredity.)

Regarding so-called racial poisons, 58 per cent believe that we have them. The majority of these limit their opinion to a belief that alcohol and syphilitic toxins are thus effective. Still others, in diminishing numbers, believe that tobacco and even tea and coffee belong in this realm. Ten per cent do not believe at all in the whole theory of racial poisons. Thirty-two per cent are noncommittal—they are from Missouri, they want to see more evidence.

In this connection it is interesting to note the report of Raeder, of Boston, to the effect that in blood and spinal fluid examinations made in twenty-two children born of syphilitic parents the reaction shows strongest in the oldest child—the one born soonest after the parental infection—and becomes more and more mild in later offspring. This authority believes that mental deficiency found in families not characterized by feeblemindedness is, in the majority of cases, due to syphilis.

Question 9. If you do not believe in the permanent hereditary effect of so-called "racial poisons," toxins and hormones, do you believe it is possible to affect the offspring variously for several of the immediate succeeding generations?

Concerning this problem of racial poisons, 60 per cent expressed themselves as believing in this theory, 5 per cent disbelieved in it, 35 per cent refused to commit themselves. That is, a great many authorities, while rejecting the teaching that so-called "racial poisons" can permanently influence heredity, have been led, by such experiments as those of Stockard, to believe that these poisons do more or less unfavorably influence the offspring of the immediate generations.

Question 10. Can you suggest some line of research—experimental or otherwise—which might shed light on the problem of hormones as related to defective germ-plasm in the causation of inherited defectiveness?

About one-half of our friends have either referred to some line of research thought to be germane to this study or have suggested some line of experiment thought to be of value in the problem, while the other half have made no suggestions.

Little wonder that we hardly know which way to turn, in the further study of this great subject, when we pause to consider that we have only two hormones definitely isolated—epinephrin, from the suprarenal capsule, and thyroxin, from the thyroid gland—unless we accept that Robertson has isolated a hormone from the anterior lobe of the pituitary body, to which he has given the name "Tethelin."

The suggestions for further experimental inquiry, as might be expected, came largely from the experimental zoölogists, biologists and geneticists of the great universities, of which that made by Professor Castle, of Harvard, is most typical. He suggests that: "Rats or other laboratory animals should be treated with injections of, or be fed upon, ductless glands for various periods of time (and under carefully planned and controlled conditions) and the effects on the animals so treated, and on their offspring, should be noted." And, in harmony with many other biologists, he was disinclined to express an opinion in advance of the experiment, preferring of course to remain open-minded and without bias.

Professor Schaeffer, University of Tennessee, feels that: "Protein sensitization methods and glandular transplantation" would be the most favorable route for further experimental inquiry.

Professor Ranaley, of the University of Colorado, believes that:

> Experimental work following the lead of Guyer's researches is very much needed and ought to be of great value. Immunization of experimental animals to thyroid, pituitary and sex hormones should be tried. Since feeblemindedness seems more common in males than females, perhaps the testicular hormone may be of consequence.

A large number of zoölogists incline to the opinion that while the germplasm mechanism accounts for and determines the inheritance of defectiveness, the determination may be modified by subsequent differentiation due to various hormones, and cite Dr. Lillie's classical experiment with the freemartin in support of this position.

Harvey Cushing, of Boston, believes that great rewards are ahead of those who will investigate this field—particularly the pituitary gland. He refers us to the studies of Smith on the pigmentary and growth alterations of tadpoles who are deprived of the epithelial rudiment of the hypophysis.

It is highly probable that we are not by any means familiar with all of the hormones which work together to bring about chemical coördination

in the human mind and body. We know that every living cell secretes carbon dioxide. Some authorities today even believe that the whole brain is a vast endocrine organ, giving out into the circulation substances which might properly be regarded as endocrines or hormones. The physiologist has long ago called our attention to substances such as secretin which stimulates pancreatic secretion. It has more recently been shown that no matter where the developing optical vesicle of the embryo may be placed the skin immediately overlying it will promptly develop into a crystalline lens. We know very little of the function of the adrenal, outside of the fact that it influences blood pressure, can apparently be affected by psychic stimulation as well as chemical, and that mammals die in little more than twenty-four hours when it is removed, and that its effect is so very subtle that one part of adrenalin in one hundred million of Ringer's solution produced a marked effect on the contraction of involuntary muscle.

Descartes thought the pineal body was the seat of the soul, and we know little more about it now, except that when it is removed there often occurs a precocious development of the sexual organs. The limits of this paper forbid the discussion of the interesting developments in recent years regarding the sex glands and secondary sexual characteristics, though it is evident that the fetus in the pregnant female must act somewhat in the rôle of an endocrine, as the injection of an extract of fetus from a pregnant female into the blood vessels of a virgin rabbit produces an immediate growth of the mammary glands. This is further illustrated by the famous case of the Blazek sisters, who were joined like the Siamese twins, since pregnancy in one produced a normal growth of the mammary glands in the other, and with the birth of the child the secretion of milk occurred in the glands of both individuals.

Severe disturbance in the endocrine system unfailingly leads to more or less marked criminalistic, immoral, and antisocial behavior. When the secretory disturbance is limited to the sex glands, it sometimes results in the production merely of feminine men and masculine women.

We have at last progressed to the point where we know that most of the freaks in the dime museum of the circus—the bearded lady, the giant, the fat girl, and the midget—these "marvelous freaks of nature," are due to endocrine disturbance, but we have not progressed to that point where we are able to offer practical help to these victims of ductless gland dystrophy. Much less are we able to formulate precise opinions and suggest definite remedies with reference to this almost wholly unexplored and undeveloped field of hereditary mental defectiveness and the relation of endocrine disturbance to the defective germ-plasm which is the cause thereof.

While, in humility, we should withhold our opinions until we have more knowledge, yet if I may be permitted to express my own views as the result of this study and from my own clinical experience, it would be to the effect that there is little help to be expected, in the near future, from endocrine therapy in the more marked cases of hereditary defectiveness, but I do believe that at some future time, when we shall have come into possession of more complete knowledge regarding epilepsy, dementia praecox, and migraine or nervous sick headache, we can hope—after the differential classification of the disease now known by these single diagnostic names—I say that after this improvement in diagnostication, the development of endocrine therapy will afford the possibility of relief for certain types of individuals suffering from these disorders.

This is not the time to stir the emotions and arouse false hopes in the public mind. This is the time for experimental work and the clinical testing out of facts and theories. This is the time to make our appeal to the experimental biologist and the practicing clinician to help us to find facts and ascertain truths, and it is to be hoped that the public can be spared that exploitation which will cause the next generation to lose all faith in this matter. There is danger of reaction which will be worse than the lethargy which followed the early and over-exploitation of Brown-Sequard's experiments. There is great danger that ten thousand times more harm will be done the public by our present day monkey and goat gland transplantation than any good which may accrue to the individual who may become the possessor of such a transplanted gland.

SOME LIMITATIONS OF PRESENT THEORIES

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Present theories of eugenics, including factors of heredity and the evaluation of human efficiency, rest primarily upon three constituent theories: the Weismann theory of germ plasm and the non-transference of acquired characters; the Mendelian theory of heredity; and modern methods of clinical research and testing in the psychological laboratory.

So long as we recognize the theoretical character of these formulations, we shall keep our minds open to their limitations. There should be no tendency shown to elevate the theories into indisputable realities and to minimize the force of contrary arguments. Scientific theories are nothing but working hypotheses, and we must keep ourselves tuned to detect the slightest sounds of discrepancy. Indeed, instead of discouraging differences of view, we ought to encourage and invite them. It is not a confirmation of our theories we should seek, but the truth behind them.

Geneticists holding the theories mentioned, can point with satisfaction to the fact that a great mass of experimental and observational material has been assembled by indefatigable research workers which largely harmonizes with them. The two theories of heredity, Weismann's and Mendel's, seem to fit together very nicely and also to dovetail with the Darwinian theory of evolution, although Darwin did not exclude the possibility of the inheritance of acquired characters. The tendency has developed to stress heredity and to minimize, if not to exclude, factors of environment and education. Yet, there has also been much discussion to the contrary, and especially Weismann's views have never been accepted by all investigators.

The Weismann theory postulates that we are dealing altogether with family stocks; that the germ plasm from which the new life springs through the mating of two individuals of opposite sex is inherited and immutable, except so far as the blending of stocks produces new mixtures; that race betterment is entirely dependent upon the preservation and combination of desirable stocks through mating; that the individual life of the immediate parents has no effect upon the offspring except that the mother is, during the period of gestation, nurse to the child which, however, is from the moment of conception an independent being.

The new individual's own development depends, then, exclusively upon environmental influences which, however, can neither change inherited strains nor affect his own offspring to whom he merely transmits his inherited germ plasm unchanged. Every new individual has to rely, for human progress, upon what has been called "social inheritance"—"the environment and training and experience of former generations are handed down to later generations through custom, tradition, history" (Conklin). But this inheritance is comparable to the inheritance of property the use of which depends upon the foreordained character of the beneficiary who, in his turn, may transmit his fortune, but not his accumulated experience of individual human evolution, to his heirs.

Thus it is maintained that progress rests altogether upon the survival of the fittest, upon the successful struggle of individuals for existence through chance variations, and upon the reproduction and perpetuation of these chance superiorities through sexual selection which, for all we know, has also been largely fortuitous. Nobody will deny the important rôle which "good stock" plays in the development of the race. But what is good stock?

Human nature, it is true, has been practically the same from the time of Hammurabi to the present period. But it does not impress all with equal force that the evolution of man from the Neanderthal or Cro-Magnon period should have been accomplished altogether without a direct effect of what we may broadly call the perpetuation of acquired characters. The question has not yet been satisfactorily answered: what caused the original variations and mutations? Was it all chance? Or were there distinct external causes affecting the germ plasm? If there were conditions in the life of prehistoric man which affected the germ plasm so that mutations occurred, we might recognize similar causes in historic man. Note the observations of anthropologists in regard to the creation of a new "American type."

In his book, "World-Power and Evolution," Ellsworth Huntington produces evidence of how climate has affected the development of the human race. He admits that the evidence as to the cause of mutations is still slight. But, "on the basis of such scattered facts as are as yet available we have framed the hypothesis that the commonest cause of mutations and thus of the origin of species is germinal change due to the action of extremes of heat and cold upon the organism in its early stages of growth. If such an hypothesis is accepted, it will doubtless demand a readjustment of many old ideas, but there is nothing about it at all inconsistent with the strongest possible belief in the importance of heredity." This modest statement is

significant as it may throw light upon some of the original causes of mutations which affect the germ plasm.

As the embryonic individual is "sensitive to certain alterations in the environment such as thermal, chemical, and electric changes" (Conklin), receiving "raw materials and environmental stimuli" (ibid.), we must consider prenatal influences to have a wider range than the strict Weismannist may wish to admit. Modifications of the mother's blood and of her metabolic process must affect embryonic development. Nervous and psychic phenomena in the pregnant mother may indicate inherited predisposition; but it is also possible that they do not in all cases. Even though it is true that the mother's connection with the embryo is largely a nutritive and indirect one, we may suggest that the characteristics and the function of the blood plasma are being studied from new angles, and that these studies may throw light on congenital influences still but vaguely understood. It has already been conceded that acquired syphilis can be transmitted, its germs passing from mother to fetus, affecting the germ plasm. Knopf maintains that through the maternal circulation the blood in the placenta and fetus may be impregnated with the toxins of tuberculosis.

But it is also possible that parental development itself, on both sides, will affect the condition of the reproductive organs with their store of germ plasm, producing mutations. It has been admitted that such modifications, called "inductions," have been carried through several generations. But it is asserted that these mutations are not fundamental and pass away again. Yet, the admitted facts open up great possibilities, covering the past, present and future. Paternal influence can of course be thought of only in terms of mutations in the germ plasm itself.

The *Journal of the American Medical Association* reported approvingly the argument of M. H. Fischer who says that the fact that mutilations are never inherited is no argument against the inheritance of acquired characters; for mutilations are not acquired but inflicted, and truly acquired characters are those developed in a functional way, through effort or performance.

Casper L. Redfield, in studying the breeding of horses, cows, hens, etc., comes to the conclusion that the race-winning colts are the progeny of mature horses that have by long practice attained high speed before the colts were born. Fischer's statistics of human beings seem to show that, other things being equal, the children of older parents "exemplify in a striking way the inheritance of acquired characters." He claims that the probability of being eminent when born from a father over fifty is from five to ten times that of when born from a father forty or less. Studies by

Havelock Ellis and Redfield on the pedigree of eminent men appear to confirm this contention. But whether this is universally true or not, we may at least admit that the problem of the inheritance of acquired characters, within limits, is still an open one. We may not be ready to concede the transmission of definite acquired states, yet consider the plausibility of inheritance of developmental dispositions and potentials.

The Mendelian theory of heredity is practically an adaptation of the so-called "Laws of Chance" to human progeny, and only another formulation of the Darwinian and Weismannian theories. It has found acceptance almost universally among biologists as a result of breeding experiments with plants and animals, and of studying a number of human family trees. There are discussions as to the relative inportance of dominants and recessives, of chromatin and cytoplasm, etc., but they do not affect the general situation.

The characters whose inheritance has so far been worked out satisfactorily are mainly superficial, such as color, size, form. Mendelists assert that it is easy enough to see that any important structure or function must be due to the interaction of a large number of factors, and it is no cause for apology that geneticists have not yet been able to isolate all the factors that go to make such a character. Of course not. If we consider the complexity of the nature of mental ability and moral character we may be justified in fearing that too sweeping conclusions have been drawn from the facts at hand. Some of the conclusions even seem to conflict with the theory of the non-transference of acquired characters. Certain deductions based upon researches into the causes of mental defect and the inheritance of mental disease may be doubtful, and we may find simple somatic conditions and injuries to the germ plasm at the bottom of apparent mental traits. Conclusive studies of defective brains are few; cretinism may be caused by lack of the iodine component in the body; defects in the functioning of ductless glands may account for mental deficiency—proper medical attention to the adrenal system may change the mental functioning of an individual.

I am far from ignoring the great value and general plausibility of the Mendelian laws. But we cannot entirely overlook the puzzling exceptions which have been recorded in the charting of hereditary elements. We may be justified in saying that the family charts constructed to elucidate human hereditary traits cannot be considered as conclusive, as correct without challenge, or as complete, in every detail. Even these, however, have shown that recuperation to the normal from an allegedly deficient strain is very possible. Nature tends to return to normal levels.

That many mental and temperamental constitutions may be explained by the workings of single factors like endocrine abnormality, does not solve all the problems of personality, nor does it disqualify the claims of those who would give a wider range to the transmission of acquired potencies. We must also admit that the Mendelian theory is rather mechanical in its application, relying upon the workings of mathematical relations. It has been said that it recalls the materialistic conceptions of half a century ago. This contention has been rejected, and it has been stated that no assertion is made that "matter" is the cause of "mind," but that life is a unit in the germ cell. "It seems to me," writes Professor Conklin of Princeton, "that mind is related to the body as function is to structure." Precisely, and there are different views regarding this relationship. Philosophically speaking, these views lean towards the theory of what has been called "monism," or the one-ness of force and matter. If a personal note is permitted I will say that my own leanings are in the same direction. Since we have learned that electrons, or units of pure force, are the basic units of "matter," this theory has received new impetus. But we must be clear about the fact that such views take no cognizance of those elements of personality which are "psychic" or "spiritual" in essence, if there are such things. In spite of assertions to the contrary, extreme views about the decisive influence of heredity contrast sharply with many of the ethical conceptions of the race. We may well claim that the human soul is still an unsolved mystery, and that the biological viewpoint presents only one aspect of the riddle of human life. It has its limitations, and we must recognize the claims of other viewpoints. We must approach the problem from more than one angle. The problem of life has many aspects.

Psychological testing has similar limits. It has rendered valuable service in determining differences in mental operations, in vocational aptitudes, in scholastic endowments. But it has been overstressed. We are witnessing a veritable epidemic of mental testing. Extreme claims have been made for these "short-cut methods of sizing up men." Halbert P. Gillette, editor of *Engineering and Contracting* (Chicago) points out one of the gravest of the fallacies of these tests, namely the "assigning of quantitative values to incommensurable qualities, and then using these quantities as if they were related to common units of measure."

The tests commonly in use are all based upon the original method of the Binet-Simon scale, creating the artificial index of a so-called "mental age." They fail, as they are usually applied, to penetrate into the deeper recesses of the conscious self, to reveal the workings of the subconscious mind, of the phenomena of suggestion and of hypnotic states, and to measure what we may call the "metaphysics" of human conduct.

When their delusive results are linked up with theories of heredity, a new element of concern enters. They have been applied in measuring human values in terms of social strata. The element of "good stock" is introduced in a questionable manner. Donald G. Paterson, in *School and Society*, states that the tests involved in a mental survey of the school population of a small Kansas town, using Pintner's scale, were measures of native endowment, relatively unaffected by social and economic forces. He contends, therefore, that the inferior mental ability of children found in poor social surroundings, is not due to the social factors involved, but to the mental inferiority of the parent stocks.

Roswell Hill Johnson, in a study published in the July, 1921, issue of *Social Hygiene*, comes to similar conclusions. Views like these would seem to undervalue the tremendous influence of geographical, political, economic, and educational factors, the factors of opportunity. The force of "social inheritance," of history, habits, customs, etc., would be greatly minimized. If we accept these views as true, we might wonder why there should be any great excitement or worry about economic and social reforms. Every attempt of the underdog to rise would be futile. Everything is as it is because of genetic development, dividing the race into social classes, and the burden of heredity would be heavy on the shoulders of the mass.

That there are different levels of civilization and culture, and differences in efficiency types, is not denied. But that concession does not imply a native and permanent inferiority of certain groups, outside of a restricted number of extreme cases. We must not confuse weakness with degeneracy, or differences in economic types with social inadequacy.

If it were true that the "lower social strata" represent generally inferior stock, the outlook for making the world safe for democracy would be gloomy. At least one half of the American people would probably rank with the inferior. They are quite prolific, and we may debate the question whether this fecundity is an inferior or a superior trait. May be President Harding was wrong in congratulating the parents of a brood of sixteen children. Sterility may be termed a lethal factor. May not the disinclination of the "higher classes" to breed and propagate indicate an acquired social or racial inadequacy?

Must we depend upon the gradual weeding out of the tremendously numerous alleged inferior stock, by breeding "higher types?" Must we meanwhile be satisfied with training the burdened individuals within the limits of their capacity, without enabling them to transmit their acquired potencies to their children and children's children? Can we transmit only opportunities? Must we begin all over again with each new-born individual,

without increasing his capacity for training from generation to generation? If this be so, and if philanthropy and social and educational reforms are idle dreams, the millenium is indeed far off.

There is something wrong with these methods of testing and with the application of their results to economic classification and evaluation.

When mental testing includes the careful diagnosis of the educational and medical expert, the observations of the trained social worker, and of the psychiatrist and nerve specialist, with a proper dosage of conservative psychoanalysis, we shall have a better picture of the personality and psychic endowment of an individual than a mere "psychological test," as generally understood, can give. But the careful analyst will admit that the best diagnosis will fall short of a final evaluation of human worth and conduct.

I appreciate fully the marvellous work done by our indefatigable geneticists and the tremendous vista of research and knowledge they have opened up. But this a young science. We should be cautious in generalizing our findings, or in emphasizing one factor over and against another. We must go behind the returns. We should admit our limitations. Behind all the great and fascinating facts which careful students of eugenics collect, there are truths hidden which we cannot, perhaps, yet fathom. Things may be very different from what we think they are. It is necessary to reserve judgment. The final formula by which we can safely solve the riddle of human personality has, perchance, not yet been found.

PURE SCIENCE WORK IN HIGHER EUGENICS

MILTON FAIRCHILD

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I am speaking as an educationist, and bringing words of encouragement and of appeal to those who are scientists in the study of eugenics. The professional educationist is keenly interested in eugenics, because it is through education that organized society under a republic prepares children for their lives as adults among a free people, and part of that life for each child, probably, will be the married life, the home life, the begetting and rearing of children.

The educationist is the controlling factor in the application of all the sciences to the problems of bringing up the children of the nation. All sciences are background sciences for education, but those having to do with human life are directly essential to decisions as to the processes of education. A brief list of these is as follows, namely, anthropology, biology and physiology, hygiene and medicine, genetics and eugenics, psychology and psychiatry, sociology and history, political science and economics, ethics and philosophy. In all of these the purpose to serve the educationists in their work of educating the children of the Nation should be influential.

I have brought with me for distribution a few copies of a bulletin entitled the "Public School Educational Reservoir of the United States," which gives a list of the educational organizations which wish to make use of the results of research in these basic sciences. The educationists and the multitude of teachers are a more important constituency than the university students. The educationists will never be satisfied as students are with interesting and stimulating but unverified generalization. The children gain or lose according as these basic generalizations are true or untrue.

These sciences essential to decisions in education are very complicated indeed in their fact bases, and lend themselves to superficiality. In all probability, we should divide each one of them into a lower and a higher science in order to guard ourselves against superficiality. In literary work there is a higher and a lower criticism. Lower has to do with the text, say of Shakespeare, and higher with the meaning and argumentation. The distinction is not one of grade or quality of work, but of class. In a house we have a foundation and a superstructure, of equal importance.

Take psychology as an example. It has physiological phases which are as important as any other phases, but which do not furnish an adequate basis for decisions as to education. When physiological psychology explains how the mechanism of reproduction in all animals, including humans, works to beget new individuals of the species, it has furnished no adequate basis for sex education of children, because the psychology of the personality in its higher love functionings had not been explained. A young woman in her sex love makes choices. Her friend John does not win her love, and to become his wife is impossible save as she degrades and stultifies and defies the highest and finest qualities of her womanhood. But another youth approaches her, and she becomes interested in him sexually. Her best womanhood goes out in yearning toward his manhood, and she will gain the greatest and holiest inspiration of her life from mating with him, bearing his children, and coöperating with him in rearing them in their home for citizenship in their nation. Psychology is under obligation to offer true explanations of these higher superstructure experiences of personality, and educationists insist that they must have the truth in higher as well as in lower psychology.

Successful university lectures can be given by combining unverified hypothetical generalizations, designated as modern psychology, but the educationist has no satisfaction in making use of generalizations which have no reliability. The educationist has to have reliable generalizations because without this knowledge there are no solutions of his problems possible. He considers it the bounden duty of the psychologist to produce this reliable higher psychology.

There is a lower and a higher sociology, a lower and a higher economics, a lower and a higher eugenics, et cetera, a lower and a higher section for every science having to do with human personality in its activities; and education demands that the inadequacy of the lower thinking be recognized and admitted, and that these different groups of scientists of the human personality organize for successful research in the higher section as well as in the lower.

Educationists are now in a position to enforce this demand for adequate and reliable results from researches in these human sciences, because there are numerous educational organizations which are in a position to approach the governing bodies of our universities with influence.

The Character Education Institution, Washington, D. C., of which I am chairman, has as its directors almost all the state commissioners and state superintendents of education throughout the United States, and is developing its research faculty for the solution of problems in our field. This

Institution wishes to use the results of researches in all the human sciences as a background for decisions as to methods and materials and undertakings in character education. It will have to insist on reliability of generalizations in eugenics and the other human sciences.

Researches in eugenics should be organized strictly according to scientific methods both lower and higher with the objective in mind of furnishing society, the educationists in particular, with complete, adequate and reliable truth in the field of the reproduction of human children. The eugenists who rush into championship and publicity for unverified speculations as to birth control, control of sex, free love, age of parents at the time of conception, pre-natal influences, inheritance of abilities and diseases and of susceptibilities, non-inheritance of acquired traits, et cetera, should be degraded from the ranks of the true scientists in eugenics. They will win nothing but contempt from the educationists. We cannot secure an adequate psychology from the study of a monkey, nor an adequate eugenics from experiments on guinea-pigs and frogs and flies. This is not to say that very important knowledge in lower psychology and in lower eugenics cannot be derived from these studies. But higher psychology and higher eugenics has to be derived from the study of human beings. I have brought with me several copies of a character chart of the perfect human being which shows how complicate the personality of a human being really is.

We are depending on eugenics to mature as a science, and to furnish adequate and reliable generalizations for use in deciding what education ought to be given boys and girls as a preparation for their lives as fathers and mothers in the homes of the nation. These are my words of encouragement and of appeal.

EDUCABILITY AND INHERITANCE

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When the brain of the new-born child is examined under the microscope it is seen to be in a very undeveloped condition. Many of its cells still retain their embryonic form and cell processes are simple and few in number. At this stage Mind is practically non-existent. Gradually, and with the lapse of years, the mental functions come into being. The development of the sensory functions, whereby the child is put into communication with the outside world, makes possible perception; this process, in conjunction with association and memory, gives rise to the capacity to form mental images, to compare, to think, to imagine, to invent, to judge and to reason. The linking up of these higher mental processes with his motor pathways makes possible the manifestations of will and desire, as seen in speech and those intelligent adaptations of the individual to his present and future needs which we designate conduct and behavior.

Between birth and the age of twenty-one years the weight of the brain increases from an average of 300 grams to one of nearly 1400 grams, or more than fourfold. During the same period the circumference of the cranium increases from 14 to 21½ inches. There is reason to think, however, that all the component functions of mind have attained their maximum development by about the sixteenth year and that after this age increase of mental capacity is more a matter of increased knowledge and complexity of association than of the coming into being of any new function.

The development of the mind thus takes place pari passu with the development of the brain and is the resultant of two factors; (1) an inherent tendency on the part of the brain cells to develop, (2) the stimulation of these cells by impressions and vibrations from without. Much of the external stimulation to which the brain of the child is subject is necessarily haphazard and fortuitous, but much is also deliberate and systematic. This latter, associated as it is with the imparting of definite facts and items of knowledge constitutes what is known as Education and the term "Educability" is often restricted to the capacity of the child to respond to this organized system of training and instruction. It seems desirable, however, that we should use it in a wider sense, and for the present purpose I shall

use it as meaning the general capacity of the child for mental development, that is, his capacity to respond not merely to the graduated and organized methods of development known as education, but also to those haphazard and unorganized factors which are inseparable from his environment.

By Educability, then, I mean the capacity possessed by the child for mental development; and by mental development I mean the evolution of those functions of mind which are normal in his race and nation. It is obvious that this question of educability is not merely one of pedagogic, but one of the utmost social importance; for the presence in a community of any considerable number of individuals who fall markedly short of the average standard must seriously diminish the efficiency and lead to the decline, and even decay, of that community; whilst it is to the presence of an increased capacity for mental development that we must look for racial progress.

Now it is obvious that the development actually achieved varies very greatly in different individuals, and the first question which arises is, Are these differences due to inequalities in the methods of education and faults in the environment, in other words are they due to inequality of opportunity; or are they the result of innate differences in individual capacity for development?

It is quite clear, and will be admitted by everyone, that the child whose educational advantages have been poor cannot attain the same degree of intellectual development as a child of similar innate capacity who has been more favorably situated—a child who has had no opportunity of learning the French language cannot be expected to talk French. On this point I may say that there is every reason for thinking that any extensive withholding of impressions from without, either as a result of disease of several organs of special sense, or of long continued seclusion, will so interfere with mental development as to give rise to a state amounting to mental deficiency; as witness the cases of Laura Bridgman and Kaspas Hauser. Further, there is no doubt that the development of the brain cells may be impeded by faulty hygienic surroundings and conditions of ill health. For instance I have no doubt that the child who suffers from insufficient food, exhausting physical strain, defective sleep, as well as more definite disease, may thereby be considerably handicapped in his mental development. In a few cases the handicap may be so great that the arrears are never made up; generally, however, it is of a temporary nature only, and disappears when the cause is removed.

On the other hand we have to remember that good educational facilities now exist in most civilized countries; in England, for instance, education

has been compulsory for two generations, and yet, as every teacher knows, the capacity for response and the result achieved differ enormously even amongst children having exactly the same opportunities and coming from an identical environment. Some children, for example, will make rapid progress in art, music or languages with very little instruction, others will completely fail to master these subjects although they may be supplied with every facility and encouragement. The study of biographies shows that not a few children have acquired considerable intellectual attainments and have even risen to a position of eminence, with very meager educational advantages; and this has sometimes taken place amid wretched hygienic surroundings and under conditions of ill health. These differences extend into the moral sphere, and there is a large and very important group of children known as moral imbeciles, who are characterized, amongst other defects, by a complete and incurable lack of the sense of social obligation or of the difference between right and wrong, although they may have been brought up with the utmost care and subject to the best example, the wisest precepts, and even punishment. Differences like these I have mentioned, and I might specify many others, occur amongst children attending the same school and living in the same street, and are not peculiar to any particular class or section of society.

It is quite clear from these and similar facts that although the nature of the environment plays a part in the result attained, inasmuch as it may favor or handicap development, it does not under ordinary conditions play the essential part. The chief factor which determines the extent and the nature of the child's mental development is his intrinsic and inborn potentiality for such development. In fact, I think we need have no hesitation in saying that just as every child is born with certain potentialities for bodily growth, in virtue of which he gradually develops the physical configuration of his race and stock, so is he born with certain potentialities for mental development, both as to the nature and degree. The nature of the child's early experiences may of course mould his thoughts and shape his future life, but the total mental development to which he will attain, and the nature of his aptitudes, must, at the bottom, be dependent more upon his innate potentiality for such development than upon his environment, unless this is markedly abnormal.

Further enquiries show that whilst in some cases these variations in educability occur sporadically, that is to say that one member of a family may differ very considerably either in an upward or downward direction from his parents and brothers and sisters, yet on the whole they show a strong tendency to be hereditary and to have a familial character.

With regard to endowments, the fact of the inheritance of general ability was first demonstrated statistically by the late Sir Francis Galton, the father of Eugenics. Galton selected one thousand men, each of whom was sufficiently eminent to rank as one man in four thousand, and comprising judges, generals, statesmen, poets, painters, scientists and divines. He then examined the careers of their relatives, and amongst these he found 89 eminent fathers, 114 eminent brothers, and 129 eminent sons; in all 332 immediate relatives of the same degree of eminence as those who were the subjects of his enquiry. Investigations into the next degree of kin showed the presence of another 200 men of the same eminence.

Galton showed from his researches that the chance of a son of an eminent man showing eminent ability himself was about 500 times as great as that of a son of a man taken at random. I may remark that Galton's own genealogical tree is itself a very apt and striking confirmation of the facts which he demonstrated; for including the allied families of Darwin and Wedgwood there have been no less than 16 men of the highest scientific note, of whom 9 are Fellows of the Royal Society. Galton's conclusions have been confirmed in more recent years by the enquiries of Karl Pearson and W. C. D. Whetham.

The above mentioned researches refer more particularly to the inheritance of general ability; there is evidence that ability in a specific direction may be similarly inherited. We see this in regard to Art in the case of some of the great Italian painters. For example, Jacopo Bellini and his two sons Gentile and Giovanni; Antonio Vivarini and his younger brother Bartolommeo, together with the two Luigis, also members of the same family; Ludovico Carraci and his two cousins Agostino and Annibale; Lippo Lippi and his son Filippino; Gaddo Gaddi, his son Taddeo and his two grandsons Agnolo and Giovanni. Doubtless in many of these instances the individuals were brought up in an atmosphere favorable to the development of their talent: when we consider, however, that all those I have mentioned were not mere local celebrities, but were painters of European fame whose works now adorn the leading galleries of the Continent, it is evident that they must have been possessed of conspicuous *natural* ability—this is particularly evident when we bear in mind the hopeless failure which often results in the case of individuals who spend almost endless time and money upon tuition but who have no natural aptitude.

Music also furnishes examples of the inheritance of special ability, and perhaps the most remarkable is that of the Bach family, to which I may briefly refer. The earliest musician in this family appears to have been Veit Bach, born in 1550, a miller and baker by trade, but with a great

fondness for playing the flute in his leisure hours: his son Hans, a carpet weaver by trade, acquired a considerable local reputation as a violin player: Hans' son Heinrich was the organist at Arnstadt, whilst several other sons possessed great musical talent. In the next generation three members, Christopher, Michael and Ambrosius, were professional and distinguished musicians. In the next generation we have the two brothers, John Christopher and the most celebrated member of the family, John Sebastian. John Sebastian Bach (born 1685, died 1750) is a striking instance of the inheritance of musical talent revealing itself at a very early age. He was never afforded any special advantages, because his elder brother John Christopher, in whose care he was left from the age of ten owing to the death of his parents, appears to have been so jealous of his gifts as to have refused him access to some sources of musical education which were available. John Sebastian married twice and had a family of 11 sons and 9 daughters. All the 11 sons were musicians of marked excellence, but 4 of them stand out conspicuously, namely, Wilhelm Friedemann, Master of the chapel of Hesse-Darmstadt; Karl Philip Emmanuel, Director of the Orchestra, Hamburg; John Christopher Frederick, Master of the Chapel at Buckeburg; and John Christian, who went to London, where he acquired great reputation as a composer. To summarize, I may say that in the 4 generations of this family no less than 50 members were professional musicians of marked ability, and several of them of such excellence as to rank amongst the immortals.

The same hereditary tendency is seen with regard to diminished developmental potentiality. I have known several families of which many members found difficulty in spelling, others which found arithmetic a stumbling block, and others which showed a pronounced inability to acquire school knowledge, although they were sharp enough in looking after their interests and successful in life. It is well known that a large proportion of disorders and diseases of the mind and nervous system are the result of a particular family tendency, and I showed many years ago that that serious imperfection of mental development which constitutes mental deficiency, or feeble-mindedness, is strongly hereditary.

These differences of innate developmental potentiality, however, are not merely familial; there would appear to be differences with regard to social class and race. I have no knowledge of other countries, but in England I do not think there is any doubt that, taken in the mass, the children of the professional classes show a relatively higher degree of educability than do those of the lower laboring classes. With regard to race I think it is also a fact that certain sections of the yellow and black races compare unfavorably with whites. It is also affirmed that in schools in this country (America)

where black and white children are educated together, the blacks keep pace with the whites up to about the age of puberty, but subsequently show a definite inferiority, having apparently reached the limit of their educational potentiality.

There is, however, nothing surprising in the fact that differences in educability should be inherited. Since we have seen that educability is largely a matter of innate potentiality it follows that it is germinal in origin, and its hereditary transmission ensues as a matter of course. At this point, however, we have to carry the matter a little further, inheritance is simply the mechanism of transmission, can we say how these differences arose in the first instance?

It is quite clear that this is a problem of not merely academic, but of great practical importance: it is, however, one of very great difficulty, for it must be confessed that our knowledge of the causation of germinal variations—which is what the question comes to—is still very imperfect.

In considering this point I shall exclude minor differences of potentiality; these are probably but manifestations of the tendency to vary within narrow limits which is normal and universal in life, and I shall confine myself to a consideration of those larger differences of increased or diminished capacity for development which we have seen to characterize different families, social grades, and races.

At this point it is desirable to emphasize the relationship which exists between educability and brain structure and function. It is true that our methods of microscopical examination may not at present be sufficiently delicate to enable us to demonstrate this in the majority of cases; nevertheless it has been shown that in mental deficiency there are definite changes, namely, a numerical shortage of the cells and processes of the brain cortex, together with an irregularity in their arrangement and an imperfection of their development. It has also been shown that in conditions of chronic mental decay there is a degeneration of these same cells; whilst it was pointed out by Kaes that certain layers of cortical fibres which are associative in function undergo a gradual increase with normal mental development. From these findings I think we are justified in concluding that differences either in the structure or chemical constitution of the nerve cells, or in the functional contractility of the processes of these cells, constitute the material basis of the varying differences in educability. Good general ability is dependent upon keen and accurate perception, good powers of attention, memory, visualisation, comparison and judgment, and well-coördinated motor response, and these qualities I regard as the natural and normal result of the healthy physiological functioning of a well and harmoni-

ously developed brain. In marked inferiority, on the other hand, some or all of these qualities are defective, and it is justifiable to conclude that this is due to some defect of brain structure or function.

Let us first of all consider those cases in which mental development falls markedly below the normal average of the race and class to which the individual belongs. It has been suggested that the various races of mankind were not evolved from a single pair of ancestors, or even from the same pre-human species, but that they are the descendants of different, although closely related species, which possessed fundamentally different potentiality for development. It is argued that these fundamental differences account not only for the differences in educability in regard to race, but that the mixture of these different races to form the nations which exist to-day accounts for the variations in educability amongst members of the same nation. In other words that defective mental development is either the expression of a defective potentiality which has existed ab initio or is due to atavism, or a harking back to a former condition. It is undoubtedly true that most nations are a blend of several different racial types, and this is certainly the case in the British and American nations; further, the phenomenon of atavism is well established; so that if we grant the hypothesis of inherent racial differences of potentiality it is quite possible that some cases of defective educability might be thus explained as a throw back. It is to be remarked, however, that this is an hypothesis only; we have to remember that the black and yellow races are for the most part the descendants of peoples who have for many generations lived in surroundings little calculated to favor intellectual development; where the opposite conditions have prevailed, as for instance in the Chinese and Japanese, the degree of educability would not appear to be inferior to that of civilized whites. I shall refer to this matter again presently, but it is not improbable that these racial differences in educability are due to the continued lack of stimulus in the past rather than to any inherent germinal defect of developmental potentiality.

It seems to me that in the majority of cases in which there is a marked failure to attain the degree of mental development which is normal to the class to which the individual belongs we have, not a condition of atavism, but one which is pathological, and due to germinal potentiality having in some way been impaired. In my opinion there is not the slightest doubt that this may actually take place. My enquiries into the causation of mental deficiency had led me to the conclusion that certain diseases of the individual (i.e., alcoholism tuberculosis and syphilis) may so devitalize and impair the potentiality of his, or her germ plasm as to prevent the normal

development of the offspring. The effect of these deleterious agencies would naturally be greatest upon that "determinant" of the germ plasm which represented the most delicate and most recent evolutionary achievement, namely, the germinal representative of the brain. As a result of a comparatively slight devitalisation of the germ the offspring is born with an increased instability and diminished power of resistance of his nervous system, and this condition may be manifest as hysteria, epilepsy, neurasthenia, insanity, and a defective capacity to develop the acquirements which are necessary for successful social adaptation, in other words a defective educability. With a more pronounced degree of germinal impairment there is an actual imperfection of structure, giving rise to the various grades of mental deficiency.

The number of persons who are actually mentally defective, that is to say who are so defective as to be unable to maintain their existence without some form of supervision or assistance, is very considerable. I estimate that in the United Kingdom there are at least four such persons per 1000 of the total population. There are, however, a still larger number of persons who, although not defective to this extent, are yet subnormal, inasmuch as they are defective in the power of developing the higher mental qualities to the average extent. I think that a very large proportion of these owe their condition to a germinal impairment, and that they are not the descendants of a race which has never evolved, but that they represent a definite retrogression, being in fact manifestations of degeneracy. It is important to note that a defect of this kind is transmissible, and that the propagation of these persons may in course of time produce a very serious depreciation in the aggregate efficiency and capacity of the nation.

At this point there arises a very interesting and important question, namely, if the developmental potentiality of the germ plasm may be diminished, may it not also be augmented? Or, to put the question specifically with regard to educability.—Is it possible as a result of the stimulus afforded by the process of education and the subsequent exercise of mind, continued generation after generation, to so augment the germ potentiality for mental development that the educability of the race may be increased?

This question is obviously one of supreme importance both to the educationalist and the sociologist; there is, however, probably no problem in the whole of biology which has been, and still is, more keenly discussed, and regarding which opinions are more widely divergent—for it is the old question of the transmissibility of acquired characters. Lamarck, in 1809, answered it in the affirmative, and both Darwin and Herbert Spencer supported this view; indeed until the last forty or fifty years it was accepted

without question. It was then shown by Weismann that the germ plasm was not, as was formerly through-manufactured anew by each individual, but that it was developed by direct continuity, and from this there arose the theory that it was unalterable. In consequence there appeared a school of Neo-Darwinians, which not only denied the fact of the transmissibility of characters acquired by the individual, but which affirmed such to be impossible.

Space will not allow me to enter into the pros and cons of this controversy; there are distinguished biologists upon both sides, and although the question must still be regarded as *sub judice*, I must confess that there are many facts which seem to me to justify Lamarck's view, and which are only explicable on the assumption that certain qualities acquired by the individual may bring about such a change in his germ plasm as to produce an increased tendency to the development of those qualities in his descendants. Charles Darwin supposed that the germ plasm was made up of "gemmules" derived from the various organs of the body, and that it might consequently be thus influenced by changes in those organs. This explanation has now been disproved, and the opponents of the inheritance of acquirements base much of their argument upon the assumption that not only does no mechanism for such inheritance exist, but that it is impossible to conceive of any such mechanism. More recent researches, however, have thrown a new light upon this problem, and tend to show that although Darwin was wrong as to the actual details he was probably right as to the principle.

This question is of such interest and importance that it may not be out of place if I shortly allude to it. In the human body there are certain glands, namely, the thyroid, thymus, suprarenal etc. whose function, owing to the fact that they are not provided with excretory ducts, was formerly a complete enigma. But it is now known that these glands furnish an "internal" secretion passing directly into the blood stream, and which has a most remarkable action upon the development and function of certain bodily organs. For instance, a deficiency of thyroid secretion during the early years of life causes an arrest of development of the cells of the brain, so that a variety of idiocy known as cretinism results. A deficiency of this same secretion after full development has been attained produces a condition of marked hebetude of mind. On the other hand, an excess of this secretion produces tremors and other marked disturbances of the nervous system. The other glands I have mentioned exercise a similar profound influence upon development and metabolism; so much so that their removal or disease may be followed by death. Further, there is now good reason for thinking that not only these glands, but many of the organs and tissues

of the body, such as the brain and muscles, each produce their own specific secretion, which is essential to the well-being of the organism.

Now there is not the slightest doubt that the germ plasm contains within it in some form or other representatives of all the organs and tissues to which it will give rise when fertilized; and these representatives are known as "determinants." May it not be then that the specific secretion produced by each organ of the individual may have a selective action upon the corresponding determinant within his germ plasm, and by its nature or amount tend to increase the developmental potentiality of that determinant? To put the case in more concrete form may we not imagine that an increased development and activity of brain may be accompanied by an increased brain secretion, which will so stimulate the corresponding germinal determinant as to increase its potentiality for growth?

This, of course, is at present mere conjecture, but it does not seem altogether unreasonable. However this may be, I am strongly disposed to think that there is evidence to the effect that qualities acquired by the individual which are the result of increased development may, in course of time, lead to a heightened capacity for such development in his offspring; indeed I regard this as one of the means by which progressive evolution has been brought about. I see no reason why the development of mental capacity produced in the individual by the stimulus of education and exercise of mind, continued generation after generation, should be any exception.

The social grades in democratic countries are not separated by any rigid barriers, they are connected by almost insensible gradations; nevertheless there are many individuals who are the descendants of stocks who have for generations worked with their heads, and there are other stocks who have for generations worked with their hands and toiled with the sweat of their brow in a simple capacity. I think there is no doubt that the educability of the former is distinctly higher than is that of the latter. May this difference be explained in the manner I have just described? May the same explanation account for the differences existing between different races? I think it is not impossible.

It is to be remarked, however, that if an augmentation of this kind takes place, it is certainly extremely slow; there is no question of quick returns, and it is practically certain that many generations must elapse before any change could be perceived. Further, for such progressive evolution to take place, not only must the necessary stimulus be continued over a long period, but the germ plasm must be healthy and of unimpaired power of response. Given these conditions, then, I think that a high degree of educability and good mental capacity are the natural and normal sequence. And when we

look back upon the course of evolution, and note the enormous development in capacity which has gradually been brought about in the nervous system and sphere of mind, one might even hazard the thought that man, as he exists to-day, can hardly be the culmination of such a momentous process.

We may now briefly consider the origin of "Genius," since I think that this stands upon a different footing than general ability. Genius has been defined as an "infinite capacity for taking pains;" there never was a more inappropriate definition, for this is just what genius is not. The real genius, from the psychological aspect, is totally different than the man of marked ability. This latter owes his condition primarily to a healthy brain of high developmental potentiality, but the full realization of this potentiality necessitates good educational facilities and sustained application; in other words marked ability is the result of the two factors, high potentiality and optimum environment. In genius, on the other hand, the developmental potentiality is usually in one particular direction only, outside this the genius is often a complete fool, but this potentiality is so great that whilst other persons, even of considerable ability, are mastering the subject at the expense of great pains, the real genius grasps it almost by intuition, and he develops without effort and often in the teeth of the most adverse environment. The characteristic of genius, in fact, is that it is a one-sided development, and I am disposed to think that it is really pathological and the result of an acquired germinal instability. Some confirmation of this view is afforded by the fact that the genius is often sterile and that a disproportionate number of his relations are cranks, mentally unsound, or mentally defective. This connection has so far been recognized that an argument not infrequently brought forward against any attempt to limit the propagation of the neuropathic is that we might by so doing deprive the world of a genius. But I think this is a fallacy, for the birth of a real genius is very exceptional and I believe that the good he does is more than outweighed by the harm and interference with racial progress which results from the presence of his degenerate relations.

To summarize the chief points regarding educability we may say:

1. The degree of educability varies in different individuals, being determined by an innate potentiality for mental development which cannot be exceeded; this applies equally to what is known as general ability and to special aptitudes. The full realization of this potentiality necessitates an optimum environment, under which term is included the stimulus of education. Since the environment never is perfect, it is doubtful whether any individual attains the full development of which he is inherently capable.

2. Minor variations in educability are of little significance, being merely manifestations of a universal tendency to vary within normal limits.

3. A marked diminution in educability occurs in two forms. In one, occurring in inferior races and sections of society, it is probably due to non-evolution owing to lack of intellectual stimulus continued for many generations past, and is not pathological. In the other, occurring in families and stocks not confined to any special social stratum, it is probably pathological, and the result of an impairment of germinal potentiality brought about by devitalizing agencies.

4. There is reason to think that, provided the germ plasm is healthy, the stimulus of education and the exercise of mind, continued generation after generation, may gradually increase educability. Cases of defective educability due to non-evolution are therefore improvable with the lapse of time.

5. Defective educability due to germinal impairment is probably unimprovable, and the perpetuation of stocks so affected may have a serious result in causing racial decline and decay.

6. Every individual in a community should be afforded opportunity for the realization of his innate potentiality, but the failure to recognize variations in capacity, and particularly defective capacity, is a source of great waste of time, labor, and money. What is wanted is not "equality of opportunity," but an education adapted to the capacity of the individual, as determined by periodical scholastic and psychological examinations.

THE CORRELATION BETWEEN NATIVE ABILITY AND SOCIAL STATUS

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The purpose of this paper is to present a summary of facts recently observed which taken together go far to establish a positive correlation between social status and civic worth, or, in other words, to show that the economic stratification of society corresponds in some degree with the distribution through the population of the more desirable human qualities, more especially the quality of intelligence. Eugenists have very commonly assumed or alleged the reality of such correlation. But the lack of empirical proof of it has been a principal ground of many criticisms adverse to their propaganda. Most of the new evidence I refer to has been obtained by the application of the methods of experimental psychology, the method of mental testing which Francis Galton was the first to create and apply. One piece of this evidence important by reason of the very large sample of individuals dealt with, was provided by the mental testing of recruits to the American Army raised by draft for the Great War. The evidence consists in the fact that the illiterate recruits attained a considerably lower average mark for intelligence than the literates, and this was true in about the same degree for both white and colored recruits taken separately. Unfortunately the significance of this fact is not quite indisputable. The popular interpretation of it is naturally that the literates are more intelligent than the illiterates, because they have learned to read and write. It is on the face of it equally probable that in the main they have learned to read and write because they are more intelligent. Both statements are probably true in part. The tests were designed to reveal degrees of native intelligence, and they are believed by the best authorities to do so in the main, and there is much to support that view in the large experience of mental testing that has now been accumulated. If a certain concession is made for the popular view and 50 per cent of the difference is attributed to the effect of learning to read and write in sharpening the intelligence of the literates, a large difference still remains to be regarded as a native difference.[1] Now there

[1] Unfortunately for the present argument, the tests (known as the A and B tests) used for literates and illiterates respectively were not the same, but were believed to be roughly equivalent.

can be no doubt, I suppose, that the illiterates among the recruits represented socially and economically lower strata of the population than the literates. The army mental testing has thus provided evidence that the lower social strata in this country possess less native intelligence than the average citizen; though they leave the extent of this inferiority very uncertain. Two researches carried out under my direction at Oxford were, I believe, the first to attack this problem directly. Both involved the direct comparison in respect of intellectual capacity of two groups of boys, the boys of the one group (A) being of the best professional class in the main, those of the other group (B) being drawn from the lower middle and artisan classes. In the first research (conducted by Mr. C. Burt as long ago as the year 1908) the comparison was a side issue of the main research, but it indicated a considerable superiority of the boys of group A. Mr. H. B. English carried out in the years 1913–14 a research specially planned with great care to make a comparative estimate of the intellectual capacities of two similar groups of boys. The results entirely confirmed those obtained incidentally by Mr. Burt. The boys of group A showed intellectual capacity of a distinctly higher level than that shown by group B. The possibilities of attributing this superiority to better education or other environmental influences was after careful consideration rejected. The superiority found seems to be attributable only or in the main to superior inheritance.

A third research directed to the same problem was reported in this country in 1918 by Mr. A. W. Kornhauser.[2] He investigated the proportion of children advanced and of those retarded in school, as compared with the position in school of the average child of the same age. The total number of children reviewed was 1000, drawn from five schools of the city of Pittsburgh. The schools fell into three classes according to the average economic standing of the parents. The schools of the middle standing were found to contain about 30 per cent of retarded and 20 per cent of advanced children. The schools of lowest standing showed about 40 per cent of retarded and 7.5 per cent of advanced children. The school of highest standing showed nearly 13 per cent of retarded and nearly 25 per cent of advanced children. Mr. Kornhauser adduces considerations tending to show that this result is unduly favorable to the schools of lower standing, that if the necessary corrections could be made the difference between the groups would be larger than those actually shown. The result was confirmed by a further statistical investigation in which all the

[2] The economic standing of parents and the intelligence of their children. Journal of Educational Psychology, vol. ix.

children were divided into groups on the basis of economic status of the parents as indicated by the possession of a telephone in the home.

A fourth research of a similar kind was reported in 1919 by Messrs. Pressey and Ralston.[3] This consisted like the first and second in the application of intelligence tests to school children. It is more satisfactory than those researches in two respects. The number of children tested (548) was much larger; they were all drawn from schools of one type. The children were divided into the following four groups, according to the occupation of their fathers: (A) professional, (B) semi-professional and business, (C) artisan, (D) labor. The four groups displayed intelligence of widely different degrees, the order of superiority being A, B, C, D.

A fifth similar research has recently been reported in summary by Miss A. H. Arlitt (of Bryn Mawr College).[4] She tested nearly 200 children of white American parentage, and, dividing them into four groups similar to those of Messrs. Pressey and Ralston, found similar large differences between the groups, the order of superiority being the same.

Finally, Professor Terman, writing in 1916 on the basis of a very large experience in the mental testing of children, tells us that superior intelligence is "approximately five times as common among children of superior social status as among children of inferior social status, the proportion among the former being about 24 per cent of all and among the latter only 5 per cent of all." He defines a still higher degree of intelligence as "very superior intelligence," and tells us that the group composed of these exceptionally intelligent children is made up almost entirely of children whose parents belong to the professional or very successful business classes. The child of a skilled laborer belongs here occasionally, the child of a common laborer very rarely indeed."[5]

Another point of great importance is that we have a certain amount of evidence (though more evidence bearing on the question is urgently needed) indicating that superior intelligence is positively correlated with general superiority in vigor and good moral disposition.[6] I know of no other researches that bear directly on this problem.

The present position of this question whose importance for eugenics far surpasses that of any other, seems then to be as follows: Seven separate

[3] Journal of Applied Psychology, vol. iii, The relation of general intelligence of school children to occupation of the father.

[4] Psychological Bulletin, February, 1921.

[5] The Measurement of Intelligence, p. 95, New York, 1916.

[6] The evidence of this is cited in my recently published book (Is America Safe for Democracy? Scribner's Sons, 1921) together with more details of the researches mentioned in this brief summary.

researches made in different parts of England and America by independent experts, using different methods of gauging intelligence and social standing and using a variety of statistical methods, concur in finding a well-marked positive correlation between superior native intelligence (or innate intellectual capacity) and superior social status. The conclusion that such correlation is a general fact (in England and America at least) is very strongly indicated. The conclusion is very distasteful to almost all philanthropically and democratically minded persons and will be resisted to the last ditch. If this paper should stimulate some of those who are inclined to resist it to prosecute exact research instead of repeating benevolent platitudes, it will not have been written in vain.

THE HIGHER EDUCATION OF WOMEN AND RACE BETTERMENT

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The problem of the higher education of women presents a fertile field of work for the practical eugenist.

The higher education of women on a large scale may be said to have begun in America about fifty years ago. It was the result of the efforts of a few brave leaders inspired by a broader vision of woman's place in the world of affairs. Today the education of women is accepted as a commonplace and women freely enjoy the advantages of our colleges and the professional and technical schools of the universities. The ideals of democracy call for the equal participation of men and women in the life of the nation and few restrictions are put on women who would obtain the benefits of an education. Women have been very quick indeed to utilize their new opportunities. There are now more girls than boys in our high schools and the number of women in the colleges is rapidly approaching the number of men. In the institutions of higher learning reporting to the Federal Bureau of Education, there were registered, in 1918, 151,000 women as against 224,000 men. At Columbia University, for example, there were enrolled in 1919–1920, 9117 students; of whom, 4945, or 54 per cent were men and, 4172, or 46 per cent, were women. In the summer session of 1920 at this same University, the ratio was about 67 per cent of women to 33 per cent men. Similar conditions prevail in other universities of the country. The number of women who are seeking a higher education is constantly increasing. Only the limited capacity of the buildings and other educational facilities halt the progress of the movement. Entrance to the best girls' colleges is difficult and application must be made several years in advance in order to insure a place. Certainly on the score of the large numbers affected, the higher education of women in America, is today a matter of the greatest public interest.

How does this bear on the eugenic problem? Why should those who are interested in race betterment be concerned with the growth of women's education. As liberal persons, we must surely rejoice over the growing emancipation of women and their greater opportunities for personal

enlightenment and social usefulness which education has made possible. As eugenists, however, we are not satisfied with the improvement of individuals alone, but must look for the effects of broad movements upon the race as expressed in terms of national tendencies. From this point of view, we cannot fail to be alarmed over the simple fact, now generally known, that educated women are being largely eliminated from parenthood. Graduates of the colleges and institutions of learning in America during the last half century have very obviously neglected their obligation to participate in maternity. Half of them do not marry and, those who do, follow the American fashion of raising very small families. Thus, the figures for the eastern women's colleges show that 30 per cent of the marriages are childless and, where there are children, the average number per mother is only 2.1. This means that the average number of children per married graduate is 1.4 and per graduate only 0.7 of a child. As against these figures, we find that the average number of children per married woman of native parentage is 2.7 and per women of foreign parentage, 4.4. College women who actually marry, have half as many children as do married women of native stock who are already notoriously limiting the size of their families, and have one-third as many children as do married women of foreign birth. To the eugenist, these conditions, which have shown no tendency toward improvement in recent years, are deplorable. Their continuation means the extinction of valuable stocks. In these educated women the elect of the race, the highest examples of physical strength, mental capacity and spiritual power, the most valuable social potentiality, namely, maternity, lies sterile. On the other hand, the less fit physically and mentally mate and have large families. The result is a gradual dilution of our best blood. There is a gradual leveling of our standards to meet more and more the poorer quality of the population.

The education of women is the fashion of the day. More and more of them are availing themselves of the new opportunities. If higher education involves celibacy, or sterility, the seriousness of the situation for the community cannot be exaggerated. Are these two phenomena, namely, the education of women and childlessness necessarily related? Does the one determine the other? This is our problem. It is my purpose in this paper to discover how this condition, which is so fraught with danger to the country, has arisen and to suggest some remedies which may help meet the situation.

Let us first examine the character of the education which young women receive in our colleges. From the very organization of the first women's colleges and continuing unaltered to date, educators have sought to give

them an education similar to that provided by the men's colleges and have modeled their curricula along identical lines. The inception of this movement would have seemed to offer a splendid opportunity to consider the inadequacies of the education offered to men and to correct the defects before duplicating them in the new institutions for women. But the founders of the women's schools were so obsessed with the idea of the absolute equality of the sexes that apparently they gave little thought to the special needs of the girls. It was easier to transplant whole the entire existing educational structure. The question whether the girl had a different rôle to play in the community; whether there were separate functions of paramount importance to the individual and to the state and whether there were definite duties that distinguish the life of women from that of men, these questions were either not raised at all or, if raised, have found no expression in the course of study provided.

Thoughtful critics of American education have long felt that the colleges for men were deficient in the preparation which they gave their students to meet successfully the exigencies of life. They have repeatedly called attention to the virtual futility of the traditional classical learning, the lack of correlation between scientific theories and their practical application, and the students' failure to master the fundamental principles of the subjects studied. The most incisive criticism of all has been that the boys' colleges fail to grasp their great mission as a training school for men in a democracy, but rather copy the English ideal of training gentlemen for the enjoyment of leisure and the pursuit of so-called culture. The colleges for women have accentuated, if anything, these limitations and have developed an even greater aristocratic bias. The education provided would seem to have been especially designed to serve women of leisure who were not expected to marry, or to earn their livelihood, or serve practically in an everyday work-a-day world. No wonder that we find in the graduates of women's colleges, until very recently almost without exception, a sad aloofness from the common everyday life of the community and an impatience with the simple humdrum duties in which the normal woman would ordinarily find her greatest social usefulness and personal satisfaction.

The curricula of girls' colleges have very naturally embodied the spirit of the education we have just described. The courses have emphasized the languages, and the fine arts and sciences, including mathematics. But, rarely do we find a school in which place has been given for thorough instruction in the practical arts. Little if any time is provided for teaching personal and community hygiene. Even where there are biological courses given, the implications to human life are not brought home. The sciences

of physics, chemistry and mathematics are usually so taught as to avoid their practical bearings; as though these sciences would lose their theoretical or cultural value if made useful in terms of the everyday needs of modern people. It is not difficult to understand why girls in the colleges are so often bored with their courses in science and why they immediately forget the abstract and detached ideas which they have so painfully learned. Young women are concerned over a period of four or more years with facts and theories which have only the vaguest relation to their personal affairs. At their graduation, they are, therefore, not prepared to take on definite work. The first few years after graduation are, for most girls, a very trying period of adjustment in which they must substitute reality for the dreams of the schools. Out of the residuum of their education, they must make connections with real affairs in the new and foreign world in which they find themselves.

For most girls also, the college course represents a break in the continuity of their lives. It takes the developing girl out of her home and brings her into an artificial environment, where cloistered in college halls she is surrounded almost entirely by unmarried women. Their influence on the young people must be enormous and, whether they will it or not, they, in many cases, set an example for many of the undergraduates. During the four critical years of college, the girls are taken out of an environment where they see young children and family life; where they realize through constant association, the true importance of the family unit, its innate beauty, its essential primal position in civilization. What is lost through lack of contact is not made good through clear-sighted and conscious instruction. No word is said apparently in any of the courses about the obligation and responsibilities of motherhood, nor of the fundamental position of the family in our scheme of things. Instead of this, the girls become dedicated to a life of purely academic interests, or, if it is a profession that interests them, it is not that of home-making. A century ago, this was regarded as the only field open to girls; now it is not regarded as a career worthy of the attention of an educated woman.

The kind of education which women get in the colleges and the character of their environment during this time determine to a large extent the kind of work they choose after graduation. For the most part, graduates of women's colleges enter the teaching profession. A large proportion of the graduates of women's colleges who are engaged in gainful occupations are teachers. Teaching is the one occupation the girls are able to enter immediately. It is congenial work, spiritually satisfying, socially recognized and respected. There are probably well over half a million

women in the United States who are engaged in teaching. But, if this profession be an easy one for educated women to enter, it is apparently a very difficult one for them to leave. Women who go into teaching usually do not marry. But, the community is largely to blame for this situation; for it has encouraged women to go into this field and has then put obstacles in the way of their marriage. In most communities, the marriage of a teacher means her resignation. In New York City, for example, the educational directors have put a ban upon married women in the schools. Married women cannot stay in the schools and those who marry have the choice of resigning or of denying the fact, which many do. In this respect, the directors of our school system simply reflect unintelligent community opinion which does not recognize the grave loss to the race through the sterility of so many of its best potential mothers.

I am trying to find out why educated women do not marry. There are, of course, many reasons; some of them we have already discussed. There is the curriculum, which is clearly not developing an inclination on the part of young women to marry early, if at all. The courses educate girls away from matrimony rather than toward it. Then, too, the environment of the girls during the college period contributes to this same tendency. There is relatively little opportunity for meeting young men and, in many cases, especially among the girls of strong personality, there is developed a desire to make good in a career. At twenty-four or twenty-five, the college graduate is thinking of other things than marriage, which seems to offer little or no opportunity for her personal development. She would try out her wings at teaching or business, or in some professional pursuit. As never before, opportunities are opening up in affairs and these appeal to her. Her whole enthusiasm during these vital years is for making good in her chosen work. Her friendships with men suffer because of her preoccupation. She is very likely also, to improve her economic condition through her earnings if she be employed and to develop higher standards of expenditure. She becomes "economically independent." In some such way as this, there are ruled out of consideration as possible husbands the very young men whom the college woman knows. These men are likely to be earning little, while they are making roots in their own chosen work. In many cases, they are men who have voluntarily turned their backs on the pursuit of riches and have devoted their lives to the scientific professions, to teaching, the ministry, etc., and to various fields of social service. To marry any of them would mean hardships and sacrifice and I imagine many young women hesitate to take the plunge. They, thus, lose their best opportunities for a satisfying marriage. By the time they

realize that marriage is desirable, they have lost their attractiveness and cannot compete successfully with the younger and fresher girls who are willing to take the step without so many reservations. The whole situation is crystallizing in the impression on the part of many men that college women do not make desirable wives.

I am very well aware that this complicated phenomenon cannot be explained so easily and that there are other causes at work than those we have listed. Nor am I an apologist for the attitude of men toward college women, nor for the shortsightedness of the community which makes it hard for the professional woman to continue her work after marriage without losing caste. I am attempting simply to emphasize a number of items which can be controlled and which, I believe, are playing a very large part in bringing about the results we all deplore.

What then is the remedy? Shall we discourage the higher education of women? I think not. Too much has already been gained in the liberal attitude of the community which gives equal opportunity to its women as to its men and in the desire of women to improve themselves intellectually. All this is good and must not be lost. If the type of education which young women are now receiving is, in fact, resulting disastrously, the remedy is not less education but rather more and better education. The institutions should be made over to suit our modern needs and fulfil their own great mission. The first requirement, it seems to me, is that the teachers of the girls' colleges should realize their strategic position in determining the thought and conduct of the women who come to them as students. They must themselves have a better sense of values and sincerely believe in the fundamental importance to the state and to the individual of early marriage and in the continuation of valuable lines of descent unimpaired. In their personal contacts with their students, they have unlimited possibilities of influence. The trouble is, I believe, that teachers, both men and women are largely actuated by a false sociology and their influence is not in the right direction. They stress and encourage individual achievement at the expense of the social good in their own affairs and carry the same lesson over to their pupils. I am asking teachers to be more interested in the eugenic movement to recognize its supreme importance and to impart its viewpoint to their students. This would shape the thought of the young people to a better appreciation of what is vital and fundamental in life and what constitutes its highest obligation.

This attitude on the part of teachers would also have its effect on the curriculum. Those subjects which do not bear directly on the lives of the students would be put into the background, or entirely displaced by those

which more directly affected their conduct and welfare. And, the subjects which are chosen would be so taught as to bring out their greatest practical utility. I realize that there are many difficulties to overcome in arranging a proper curriculum for college women. There are many conflicting demands that must be recognized and reconciled, and I do not pretend to have the last word on this subject. I have, however, for some time given thought to this matter and have a few constructive suggestions to offer. I believe that the biological sciences must play a larger part in the education of women than they do now. These sciences are the key to an understanding of human life and are in that sense basic to the whole structure of education. Physiology and personal hygiene must receive attention throughout the college course, because they elucidate the normal function of the human body and help students better to maintain their health and vigor. Courses in community hygiene should follow the work in personal hygiene and outline the opportunities for social service in American community life. College graduates should be prepared to become leaders of thought and action in their communities. A knowledge of sanitation, of child welfare, and of similar matters, will enable them to serve on local boards and even to direct official and private activities effectively. In the field of physics and chemistry, there is a wealth of illustrative material which can be drawn upon to vitalize the scientific principles and, at the same time, facilitate the management of the modern home. The mathematics can be utilized to make housekeeping intelligent through the development of budget systems and the keeping of accounts. The instruction in history, in economics, in sociology, in philosophy and ethics, all should bring out the relation of the individual to organized society and clarify the concept of the family as the unit of our civilization. In a word, education must create a world view that truly functions and that helps to bring out every capacity of the student for creative work and constructive service.

It is also recommended that co-educational institutions be encouraged and increased. Throughout the West, the large state universities are co-educational and the system appears to be working remarkably well. In the East, on the other hand, we have the segregated girls' colleges, or, in many instances, women's colleges under the jurisdiction of a large university and forming an undergraduate department of that university. Co-educational colleges would bring the young men and women together and offer increased opportunities for lasting friendships. The special needs of the girls would be attended to in the special courses which they alone would take. Faculties of girls' colleges should be reorganized so as to include more men and a large proportion of married women on the staffs. Thus, the

students will have more opportunities to see family life in the vicinity of the college halls and witness the actual success of women who are actively engaged in affairs and who are, at the same time, wives and mothers. Such teachers would serve as living exponents of the attractiveness of family life. The added richness of experience which maternity brings greatly increases the insight and understanding of married teachers and they become an invaluable influence in determining the ideals of the young people. There is no better place than the faculty of a girls' college for this experiment to be tried out.

The program we have outlined will not succeed if, in its emphasis on marriage and maternity, it attempts to hinder or even discourage educated women from pursuing professional work. College women will insist to an ever greater degree on making themselves efficient professionally and independent economically. This tendency should have public approval. But, two things should be kept in mind, both of which are too easily overlooked. First, home making must be recognized as an important profession and one requiring long and arduous preparation. The successful management of a household has larger possibilities for personal development than most folks appreciate and its devotees deserve much more respect than they now receive. Second, when women have chosen other careers such as teaching, medicine, law, business, whatever it is, it shall not be assumed that this service is incompatible with married life. But we must educate public opinion to look with favor upon the continuation of married women in the many positions of responsibility they are now filling so capably. The public must meet the professional woman more than half way and encourage her through concessions of various kinds to marry and bear children, and practically demonstrate that marriage does not necessarily mean her withdrawal entirely from professional activity. Thus, the half million women who teach school, most of whom will remain unmarried under present conditions, should be actively encouraged to marry and should undergo no penalties for so doing. It should be thoroughly approved for married women to teach since the community vitally needs married women teachers. It needs them as mothers because they make good ones and because, as mothers, they make infinitely better teachers. The experience of maternity gives them a more sympathetic understanding of child nature, more patience and consideration in dealing with the intricacies of child psychology. Boards of Education should realize all of this and make every adjustment necessary to attract qualified married women to the educational field. Many accommodations will have to be made on both sides to render such a plan practicable. There will be periods of absence during the childbearing

period. But, the difficulties are not unsurmountable. Moreover, the schools will gain greatly through opening the door to that large body of practical, mature, sympathetic women whose children have grown up and who are then available for important public service in the classroom. To a greater or less degree, the same principle should guide the community with reference to women in other lines of professional work. A woman should no longer be confronted with a choice of either matrimony or a career, because the two are by no means mutually exclusive. A full life involving both motherhood and active participation in affairs is quite possible with good management.

May I then conclude and summarize? The education of women is today a disgenic influence. It is leading women away from matrimony and childbearing. As education is here to stay, it must be modified in form and content to serve community welfare rather than to hamper it. This can be accomplished through a clearer appreciation on the part of educators, of the importance of eugenic knowledge. Curricula must be shaped to result in the development among the students of interest in the activities of home life as a personal ideal. The career of home making should be glorified in the colleges and the girls interested in it and prepared to manage households economically and efficiently. Graduates of women's colleges should set the fashion for good sized families and should combat the fallacy that marriage means sacrifice of power or sinking into mediocrity. Productive careers should be encouraged to continue in conjunction with marriage. Where women do not wish to engage in remunerative employment, they should play an active part in voluntary social movements working along the lines of civic improvement in a field in which their college education should prove of the greatest value. But, most important there must be a change in fashion which will make it unapproved for healthy and self-sustaining men or women to remain unmarried.

LIFE STORIES OF A CLASS OF TWENTY-SEVEN HIGH SCHOOL GRADUATES IN RELATION TO LONGEVITY AND SOCIAL PROGRESS

DYMPLE BRYANT JOHNSON

Fort Smith, Arkansas

Fort Smith was a small frontier town in 1885 when a gift of 300 acres of land, within the city limits, from the government, to the school district, established a new community life. New school buildings, an adequate force of well educated, highly trained teachers and a newly aroused sense of civic consciousness, created a powerful force which directly affected the lives of each of the group studied. All of this group were from middle class families and during childhood and youth, all lived in the same simple, sane, sensible, irresponsible way, all ate about the same food, wore plain clothes and had similar recreations. None were poor, none were rich, even as wealth was rated at that time.

It may be assumed that the environments of the majority of the parents were similar in many ways as is shown in this table of birthplaces.

Birthplaces of class members

Northern States	2
Southern States	25 (55 per cent being Arkansans)

Birthplaces of parents

		Fathers	*Mothers*
Northern States		4	5
Southern States		21	21
Foreign	Scotland	1	1
	Ireland	1	
Now living		15	15

Birthplaces of grandparents

	Grandfather	*Grandmother*
United States	40	41
Foreign	6	5
Do not know	8	8

Seventy-five per cent of grandparents known to be American born. In the four cases where the records of the grandparents are missing, there is

sufficient information in the families, that it may be assumed these also were born in the United States. Admitting this, then with 90 per cent of the grandparents, 94.6 per cent of the parents and 100 per cent of the class born in the United States, this group may be considered practically pure American stock. This one thing alone would make the past, present and future actions of the group worth analyzing and recording.

They were so enthused with the desire for more education, that 63 per cent of them went to universities, colleges, commercial schools, or normals, many of them financing themselves in various ways. This report is interesting, especially as compared with the graduates of the same school today only 40 per cent of whom attend other schools.

	Men	*Women*
Universities	3	2
Colleges	0	3
Commercial	1	1
Normals	0	5
Special*	0	2
None	3	10

* 1 art, 1 social service.

OCCUPATIONS CHOSEN

Until recent years, it was an unwritten law of the South that women should not work outside of the home. Only three of these girls in the class of 1894 obeyed this law. Exactly what influences, direct or indirect caused seventeen of the girls to break it has not been determined. It may have been the result of the attitude of the community toward education as fourteen of them became teachers. One of the other three has acquired some recognition as an artist, one is doing about the same stenographic work in railroad offices where she started, and the other was a society editor until her marriage three years later.

Four of the teachers are still doing splendid work in their profession. One changed to commercial work after teaching one term. One taught eight years, married and has been her husband's partner in his bank for eighteen years. One married a professor, who is now superintendent of a state normal and she is in charge of the social service work of that institution. The others married and have devoted all of their time and energies to their families and homes. Only two of the boys followed their fathers' businesses; of the others: one is an accountant, one a physician, two are lawyers, and one a mechanic.

HEALTH

Two of the class left Fort Smith a short time after graduation and nine years later another moved away. With these exceptions, all of the class have spent their entire lives within a radius of five hundred miles of this city. As some parts of this section of the country are accredited with a high mortality rate, it is an extraordinary record, not only that all of the class are still living, but that thirteen of the twenty-seven report never having had a serious illness or operation.

In addition to asking about the general condition of health—these questions were also used: "Are there any special reasons or conditions to which you attribute your exceptional health and longevity?" "Have you any particular reason for believing that your health and longevity are inherited or, to the contrary, that they are the result of an intelligent and rational mode of life?" From the answers to these three questions, this table has been compiled.

Health good

Mode of living (8) ..... 1, Not inherited; 2, Inherited; 1, No particular reason; 1, Both

Environment in childhood (2) ..... 1, Family long lived; 1, Family not long lived

No special reasons (5) ..... 2, Rational mode of living; 3, Inherited

No reasons (5) ..... No reasons

Health poor, but living because,

1, Long lived family; 3, No special reasons; 1, Reasonable care (5) ..... 2, Family long lived; 1, Mode of living, not inherited; 1, Both mode of living and inherited; 1, No reason

One says health "various," no reasons given.

One, health has been excellent except an incipient case of tuberculosis which was arrested after a years rest and treatment at Ashville, N. C. No return after several years.

Is there any significance in the fact that three of the five who report poor health had fathers who were chronic alcoholics?

One woman who has taught school for twenty-seven years, and attended normals almost every summer reports perfect health.

Another woman says she has been ill only two weeks in eighteen years.

Seven have undergone appendectomy.

One man lost an arm during military service in the Phillipines, but health has been good since.

One woman with a record of poor health says her mother had a similar history and that her daughter is a frail, nervous girl.

Another woman who has had seven minor and three major operations and five years of neuritis is still going strong and expects to live out her allotted time of three score years and ten.

Only one case of typhoid and malaria were reported. Both of these occurred while they were living in Oklahoma during the pioneer days. With such a splendid record of health in the group, it is to be expected that their children should have the same or better.

HIGH SCHOOL INFLUENCES

Only eight of the twenty-seven recall the marked influence of any one teacher. However, there was one teacher of English who seems to have inculcated two habits with the majority, if not all of the class. First, the habit of reading and studying books worth while as is shown in their libraries that they have collected. Second, the habit of fastidious personal cleanliness, the result, to some extent, of her frequent talks on "Not every woman is beautiful, but everyone can be beautifully clean." Her instructions on the care of the hair and teeth must have been right and obeyed as all of the girls still have plenty of hair, and only one is compelled to wear an artificial denture. In the early nineties, the Saturday night bath was a national habit and this teacher's insistance on the daily bath was almost revolutionary. But may it not be assumed that these habits of personal hygiene which she helped to fix, have been determining factors in the remarkable health and longevity of the group?

Five of the group who have made financial successes, rate their high school work very highly; two others say it had no value. Three of the four women teachers consider the high school course the foundation of all achievements. Four women engaged in various occupations place a great deal of emphasis on the good results they secured from the training; but one says, "It had no value to me whatever."

Eleven did not answer the question.

Children's records

AGE AT GRADUATION	PRESENT AGE	AGE AT MARRIAGE	NUMBER OF CHILDREN LIVING	AGES OF CHILDREN	NUMBER OF CHILDREN DEAD	AGES OF CHILDREN	NUMBER MISCELLANEOUS	HEALTH	MENTAL CHARACTERISTICS
					Men				
20	47	24	3	6, 13, 21	2	10, 16	0	Good	Normal
19	46	25	2	19, 11	0		0	Good	Good students. One now in University of Pennsylvania
18	46	29	3	15, 12, 7	0		0	Good	Normal
21	48	33	1	12	0		0	Excellent	Normal
16	43	24	0		0		0		
					Women				
18	48	20	1	22	0		0	Good until six months ago	Histrionic ability, music, interpretive dancing
19	46	22	0		0		0		
18	45	22	1	20	0		0	Good	Very bright mind. Ability for drawing marked
19*	45	22	1	18	0		0	Good	Exceptional voice
19	46	25	0		0		0		
16	43	24	0		0		0		
17	44	25	1	16½	0		0	Good	Normal
18	45	25	3	18, 14, 12,	0		1	Very good	Normal. Daughter musical

* First husband died. Married again 1919. Unmarried men, 2; unmarried women, 7; scandal, 0; divorces, 0. Serious illnesses in children reported: Operations, 0; diphtheria, 1; tuberculosis, 1; this case of tuberculosis developed in a girl twenty-one years old who had been living and studying in New York City for two years. It was discovered in the incipient stage and treatment begun at once. It is now an arrested case and she is planning to go back to work soon.

22	49	25	2	19, 17	3	3½ yrs., 1 hr., 1 day	2	Poor	Normal
19	46	26	5	21, 19, 15, 12, 8	0		0	Good	Normal
17	44	27	0		0		0		
15	42	29	2	12, 17	0		0	Good	Normal
18	45	33	1	10	0		0	Very good	Normal
			26		5		3		

All seem to have chosen occupations suited to their temperaments and qualifications as this tabulation of work and economic status shows.

Occupations

Men		*Women*	
Executives	2	Artist (husband lawyer)	1
Lawyers	2	Advertising	1
Physician	1	Banker	1
Mechanic	1	Stenographer	1
		Social service (husband school work)	1
		Homekeeper	1
		Teachers	4
		Occupations of husbands of those married and not working outside home	
		Financiers	3
		Automobile dealer	1
		Garage owner	1
		Salesman	1
		Lawyer	1
		Salesmanager	1
		Railroad traffic manager	1
		Contractor	1

Economic status

Exceptionally prosperous	1	Exceptionally prosperous	4
Satisfactory	3	Satisfied	10
Poor	1	Poor	2
No report	1	No report	1

They have created, by their own efforts, or acquired by marriage, wealth to the amount of $2,750,000. This statement is an estimate based on reports made by themselves, their families, R. G. Dun and other reliable sources.

Very little interest in the achievements of their ancestors has been shown as only four have hunted up the records which are required for membership in the Daughters of Confederacy and one for the Daughters of the American Revolution.

OPINIONS OF BIRTH CONTROL

It has been shown that this group of intelligent, successful people is practically pure-old American stock. An analysis of their replies to these questions: "Do you favor birth control?" "If so, why?" "If not, why?" should be made by everyone vitally interested in the subject.

Only one is against birth control and she gives her belief in the teachings of her Church (Roman Catholic) as her reason.

Of the seven who failed to express opinions—one is a regular old maid of the South, one a bachelor. The other five have been married thirteen years, fifteen years, fifteen years, twenty-one years, twenty-four years and *all* are childless. Is it presuming to assume that the lives of these are expressions of opinions strongly in favor of birth control?

A bachelor whose mother's family contains records of insanity, believes that drastic action should be taken to prevent the marriage and child-bearing of people so tainted.

A woman instructor in a state normal for eleven years says: "Birth control should be practiced that the race may become stronger physically. Society should condemn the reproduction of children from tainted blood strains."

A teacher in graded schools for twenty-seven years (also a Roman Catholic) says "Yes, to some extent. Mental deficients should not be allowed to marry. Poor people should not bring more children into the world than they can rear correctly."

A woman whose office work has brought her into contact with thousands of railroad men "I do not favor large families unless they can be properly taken care of and educated."

A woman who has taught country and small town schools in Oklahoma for twenty-seven years believes: "Yes, I favor birth control—on the physical and mental condition of either or both parents."

Twenty-five years experience in primary teaching has created this opinion: "Yes, the results would be a betterment of humanity, by strengthening future generations."

A woman who taught school for fourteen years and is now the mother of two children says: "Yes, to a certain extent, because of physical conditions of parents."

A teacher for fifteen years—mother of one child—believes in birth control "For the good of society and the individual."

The experiences of being a teacher for a number of years, the mother of five children, only two of whom have lived, makes this woman say: "Yes, I believe in birth control. No one should have more children than they are able to educate and raise in a proper way."

One who has always been a home woman: "Yes, from the physical and financial standpoint and fairness to offspring."

The social service worker in a state normal replies: "Under some circumstances, yes, people who are feeble minded only. Birth control is employed only by rich people. It is mis-used. Education is what is needed."

A woman who pioneered in the early days of Oklahoma and who has helped to build a town which is a good place in which to live, from these experiences has reached this conclusion: "Too many children are brought into the world and not given the care and training necessary for good citizenship."

An executive in a large wholesale house: "Yes, births should be governed by the ability of the parents to properly rear and educate their children, and by the health of their parents."

A lawyer phrases it succinctly with "Yes, for mother and humanity."

A man who has been a successful physician and surgeon since 1903 makes this differentiation which is of real value, "I believe in voluntary conception control only, in order to better care for those that are born into the family, that the woman's strength may not be overtaxed. Likes and dislikes, health and finances of parents must also be considered."

The woman who went to college, taught one term, then changed to commercial work says: "The study of heredity has been a habit of mine for years. I have watched the development of the children whose parents and grandparents are my close friends. I believe that all chronic alcoholics, all syphilitics, insane or mental deficients, all tuberculars, and all those suffering from chronic nervousness—should be masculated."

QUESTIONNAIRE ON PRACTICAL EUGENICS

1. Name and address.....
2. Present age or date of birth.....3. Year of graduation.....
4. Married, single, widowed or divorced? 5. Year of marriage.....
6. Number of children to date (1921).....7. How many living?.....
8. Ages of children living.....
9. Ages of children dead.....
10. Number of premature births or miscarriages.....
11. Do you favor birth control?.....
12. If so, on what grounds?.....
.....
.....
13. If opposed to birth control please state your reasons.....
.....
.....
.....
14. Are any of your children exceptionally gifted, or showing strong and unusual individual traits?.....Please describe.....
.....
.....
.....
15. What has been your condition of health since graduation?.....

16. If you have been seriously ill please state nature of disease or surgical operation....
.....
17. What are the health conditions of your children?.....
.....
18. If any of your children have suffered from serious diseases please give details separately for each child.....
.....
.....
19. Is your father living?..... 20. Is your mother living?.....
21. Are there any special reasons or conditions to which you attribute your exceptional health and longevity?.....
.....
.....
22. Have you any particular reason for believing that your health and longevity are inherited, or, to the contrary, that they are the result of an intelligent and rational mode of life?.....
.....
.....
.....
23. What is your present specific occupation?.....
24. Would you consider your economic status poor, satisfactory, or exceptionally prosperous?.....
.....
25. To what extent do you attribute your social position, professional or commercial success to exceptional advantages and training?.....
.....
26. Do you feel that you are happy, in the normal or rational sense of the term; or, in other words, that you have realized your expectations and are satisfied with the result?.....
.....

Please return this questionnaire at your earliest possible convenience to the undersigned. Your replies will be considered absolutely confidential. They will not be used in any individual sense whatever, but only as a collective experience of the graduates to whom they are sent. Your coöperation in this matter is sincerely appreciated. The results of the inquiry will be utilized in a paper which is being prepared at the request of the International Congress on Eugenics, which will meet in the city of New York during September of this year.

(Miss) D. B. Johnson,
115 North 4th Street,
Fort Smith, Arkansas.

Additional questions regarding which information is desired

27. Since your graduation, have you attended any other school, college or university? If so, please state the name of the school or institution, the year of your graduation and any degrees you may have received.....
.....
.....
.....

28. Where was your father born?.....
29. Where was your mother born?.....
30. Where was your grandfather on your mother's side born?.....
.....
31. Where was your grandmother on your mother's side born?.....
.....
32. Where was your grandfather on your father's side born?.....
.....
33. Where was your grandmother on your father's side born?.....
.....
34. Please state any facts as to your great-grandparents.....
.....
.....
35. Was there any one teacher or any one particular study or experience that had a marked influence on your later life and to which you attribute the formative influences responsible for your personality?.....
.....
36. What in your judgment has been the actual practical value of your high school work in determining your professional or material success?.....
.....
37. If you are a member of a patriotic society, please give the facts.....
.....
.....

THE MEDICAL APPLICATION OF THE IMMIGRATION LAW

W. C. BILLINGS

Ellis Island, New York

The ultimate object of the science of Eugenics is a betterment of the race, therefore anything tending toward the achievement of that end is of necessity a subject of certain interest to members of this Congress. In the working out of that problem various determining factors are encountered and we, at this Congress, have listened to papers of absorbing interest on sex determination, mutation, the different behavior of chromosomes, in breeding and many other things, all of which are amazingly interesting steps toward the desired end, but, in addition to things of this sort, there are matters of intense practical importance, important at the present minute and demanding the immediate application of known measures. Granting that we cannot breed a superior line from inferior stock one of these immediately important questions, particularly to the United States, is that of immigration. The arriving immigrant of today is the father of tomorrow's citizen and upon tomorrow's citizen and his descendants depends the future of the country. These few remarks are made simply to establish the place of a paper with a title such as the present one in this Congress of Eugenics.

It is surprising to realize the comparatively small number of people who have any conception of the actual methods employed by the Government in its efforts to limit the admission of undesirable immigrants and this paper is written to give, in the very short time available, a superficial and general recital of the methods used, or perhaps it would be better to say the practical application of the provisions of the Immigration Law, and I shall deal exclusively with the medical provisions, the law of course containing many features other than medical, but the latter being of greatest interest at the moment.

To avoid the confusion which seems to exist in the minds of a great many, I will say firstly that the quarantine law and the immigration law are entirely distinct one from the other. While it is true that the Quarantine Law and the medical features of the Immigration Law are carried out by officers detailed for that purpose from the same Corps, namely, the United States Public Health Service, nevertheless the laws themselves are entirely distinct and are administered by two distinct Departments of the

Government. The Quarantine Law deals only with seven diseases, namely, bubonic plague, cholera, small pox, typhus fever, yellow fever, leprosy and anthrax, the last name having been added very recently, while the first six having been the quarantinable diseases for many years. In handling these seven diseases the quarantine officers recognize no citizenship whatever, a citizen of the United States being dealt with in exactly the same way as citizens of foreign countries, provided they are, or arrived upon a ship which is, infected with any of the diseases named. It will be noted en passant that all of these diseases are of a profound constitutional character and all but leprosy and anthrax of a type usually spoken of as epidemic diseases. The Immigration Law on the other hand is applicable only to aliens, American citizens arriving at a port in the United States not being amenable to its provisions no matter what their physical condition.

The Immigration Act of 1917, provides that

> The following classes of aliens shall be excluded from admission into the United States: All idiots, imbeciles, feebleminded persons, epileptics, insane persons, persons who have had one or more attacks of insanity at any time previously, persons of constitutional psychopathic inferiority, persons with chronic alcoholism, persons afflicted with tuberculosis in any form or with a loathsome or dangerous contagious disease; persons not comprehended within any of the foregoing excluded classes who are found to be and are certified by the examining surgeon as being mentally or physically defective, such physical defect being of a nature which may affect the ability of such alien to earn a living . . . and persons likely to become a public charge.

In order to establish whether or not arriving aliens fall within any of the foregoing classes the law stipulates that medical officers of the Public Health Service shall examine them both physically and mentally, upon their arrival. This results in a certain number of medical officers being detailed for the time being as, we may say, "medical advisors" to Commissioners of Immigration, the absolute executive of the law of course resting with the Immigration Service.

In order to promote the practical application of the law certain regulations have been issued. These regulations divided physically or mentally unsound aliens into three classes as follows: Class A—Aliens whose exclusion is mandatory under the law by reason of certain specific defects or disease; Class B—Aliens not comprehended under Class A who are physically defective or diseased, such defect or disease being of a nature as to cause dependency or to affect the ability of the alien for self-maintenance; Class C—Aliens whose present defective or diseased condition is of a less serious character, but who must be certified for the information of the immigration officers and boards of special inquiry under provisions of the law. As

stated, Class A includes the mandatorily excludable under the provisions of Section III of the Act of May 5, 1917, and includes:

(1) Idiots
(2) Imbeciles
(3) Feebleminded persons
(4) Epileptics
(5) Insane persons
(6) Persons of constitutional psychopathic inferiority
(7) Persons with chronic alcoholism
(8) Persons certified as mentally defective
(9) Persons afflicted with tuberculosis in any form
(10) Persons afflicted with a loathsome contagious disease
(11) Persons afflicted with a dangerous contagious disease

Those classes representing mental defects of various degrees are self-explanatory as is also tuberculosis in any form. The dangerous or loathsome contagious diseases more commonly met with may perhaps require a word of explanation. None of the seven quarantinable disease are comprehended here as they are dealt with exclusively at quarantine stations and I wish to emphasize again that quarantine stations and immigration stations are entirely separate and distinct. Neither are the acute exanthemes, such as scarlet-fever, diphtheria, measles, etc., included as these represent acute conditions which either recover or terminate fatally within a comparatively short period, but rather this class includes loathsome or dangerous contagious diseases of a semi-chronic or chronic nature, and to use as type illustrations, among the loathsome contagious diseases, falling within this category, may be mentioned favus, ringworm of the scalp and nails, sycosis barbae, actinomycosis, oriental sore, and the venereal diseases, while among type illustrations of dangerous contagious diseases we may cite trachoma, filariasis, amoebiasis, schistosomiasis and other diseases caused by animal parasites, such as leishmaniasis, trypanosomiasis, paragonomiasis, clonorchiasis, etc. The dividing line between a loathsome contagious disease and a dangerous contagious disease is of course somewhat shadowy, it largely being a matter of personal viewpoint as to whether one considers a disease loathsome or not and that viewpoint depends to a certain extent upon one's familiarity with the condition, although the regulations do attempt a somewhat blanket differentiation. The point, however, is of no particular practical value as both are mandatorily excludable.

Class B comprehends the following conditions not included under Class A.

(1) All diseases and physical defects that in the opinion of the medical officer will materially impair a person's capacity for self-maintenance.

(2) All defective and diseased conditions of a more or less permanent character tending to call for institutional care and treatment.

(3) All conditions not incompatible with traveling but that need or are likely to need medical treatment, whether for a short or more or less protracted period.

(4) All cases of diseased, deformed or crippled children who will require unusual care during childhood, and who are likely to be physically defective if they live to maturity.

The following are only mentioned as type illustrations, it being manifestly impossible to describe in any formulated regulation for the enforcement of the law every condition which might tend to impair a person's incapacity to earn a living.

Among the more frequently occurring of these conditions, are hernia, heart disease, states of permanently defective nutrition and of marked defective skeletal and muscular development, chronic arthritis and myositis, nervous affections, malignant new growths, deformities, senility, varicose veins, defective vision, chronic malaria, uncinariasis, pellagra, beri-beri, cutaneous affections, the eruptive fevers and the anaemias.

Class C includes defective or diseased conditions which do not present, in the opinion of the medical officer, the requirements for certification under Classes A or B, but of which some record should be made for possible further reference. Classes A and B differ very materially in the way in which, under the law, they are handled by the Immigration authorities. Class A is mandatorily excludable and, unless specific authority is issued by the Secretary of Labor, of which Department the Immigration Service is a part, that the alien be landed for treatment until cured, or where for humanitarian reasons certain consideration is shown the particular individual, persons falling within this class are deported to the country whence they came.

Class B represents cases which are individual in their handling; that is, each case, with the various features concerned therewith, is, after being certified by the medical officers, considered individually by a group of immigration inspectors designated as a board of special inquiry. As the class concerns primarily only such conditions as influence ability to earn a living, it is quite possible that with the same disease certain financial, social or occupational factors may influence the final question as to whether one particular alien would be able to be self-supporting and another would not. To illustrate, it is apparent that a book-keeper, not being subjected to strenuous physical exercise and perhaps having a moderate amount of money at his disposal, will not be nearly as apt to be physically incapacitated with heart disease as would a laborer who is entirely dependent upon arduous physical work for his support. It is the function of the board of special

inquiry to inquire particularly into every factor concerning the individual case each time a certificate of this class is rendered by the medical officer and with that board rests the final judgment as to recommendation for the disposal of this type of cases.

In the execution of this law as very briefly outlined above, medical officers board every incoming vessel and inspect the first and second class aboard the ship. It may be possible that the passengers are quite unaware of this inspection as the medical officers only speak to those persons whom they suspicion of being afflicted with some condition coming under the law and then after having first ascertained from the immigration inspectors whether or not such passengers are American citizens. Aiding them in this examination is a study of the ship surgeon's sick report, a document which must be filled out and sworn to by the surgeon of the vessel and in which he must certify all cases of sickness of which he has knowledge occurring among the passengers during the voyage. All aliens in the steerage are taken to Ellis Island where the medical officers complete the medical examination. This examination as conducted today may be spoken of as reasonably thorough. I do not mean that it is as rigid as the examination given perhaps by life insurance companies or by the government before enlisting a man in the Army or Navy, but it is rigid enough to be reasonably certain that few conditions coming within the law escape the notice of the medical examiners. To illustrate the general results (Alien seamen are also subject to examinations) I may say that during the fiscal year ending June 30, 1921, 1,023,791 aliens (both passengers and crews) were inspected and of this number 258 were certified for some mental condition or tuberculosis, 1096 for a loathsome or dangerous contagious disease, 20,069 for some condition affecting ability to earn a living and 4650 for a minor affair necessitating only that a note be made of it. Of these, 140 were deported for mental conditions or tuberculosis, 493 were deported with loathsome or dangerous contagious disease and 485 for some condition affecting ability to earn a living, a total of 1018. There were sent to the hospital on Ellis Island for treatment, 16,078, both for acute conditions and conditions coming within the law and of this number some recovered, some died, some were landed and some were ultimately deported, the number of deportations having already been mentioned.

NATIVITY OF INSTITUTIONAL INMATES

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Disregarding the aboriginal American Indian, the people of the United States are either immigrants or descended from immigrants within the last 429 years. The racial character, special talents and social values of the population fluctuate from time to time. This fluctuation or evolution depends upon several factors. First, time, number, quality, distribution and sex of immigrants; second, mate selection; third, differential fecundity; and fourth—differential survival. The analysis of these factors provides the fundamental vital and eugenical statistics of the population.

The present paper presents an analysis of only one feature of one of these main factors, namely, the relative inborn social values of recent and older immigrant stocks. Social values are, in a large measure dependent upon hereditary qualities of the individual personal units, but the degree of this dependence is difficult to determine because of the lack of definite measuring rods suited to this particular purpose. In dealing with this problem it is necessary to adopt a measuring scheme, which, in the light of existing facts, can be defended as most accurate. In the population as a whole, at a given time, social instability, or social inadequacy, can be measured by the percentage of persons who are under the custody of the state because they are unable to care for themselves, or because they have committed anti-social acts and are thus a positive menace to organized society.

TYPES OF THE SOCIALLY INADEQUATE

In the United States at the present time these groups of the socially inadequate, or socially handicapped, are cared for by ten specific types of institutions. These are for:

1. The feebleminded.
2. The insane.
3. The criminalistic (including the delinquent and wayward).
4. The epileptic.
5. The inebriate (including drug habitués).
6. The diseased (including the tuberculous, the syphilitic, the leprous, and others with contagious segregated diseases).

7. The blind (including those with greatly impaired vision).
8. The deaf (including those with greatly impaired hearing).
9. The deformed (including ruptured and crippled).
10. The dependent (including orphans, soldiers and old folks in "homes").

MANNER OF MEASURING RELATIVE SOCIAL ADEQUACY

Let us follow the census classification of nativity by dividing, the people of the United States into four classes: (1) Native born, both parents native born; (2) Native born, one parent native born, one parent foreign born; (3) Native born, both parents foreign born; (4) Foriegn born. Now if all of these four nativity groups were of equal social value and social stability, and if the specific types of social inadequacy were the same in each group, we should expect to find each group represented in custodial institutions of the several types by a quota proportional to its respective members in the whole population. There is one other item we must enter here. We shall take the nativity group percentages for 1910 and compare them with the institutional quotas for 1921. This seems the fairest method of comparison, because it is clear that recent immigrants do not pass immediately from Ellis Island into our custodial institutions, but first enter the population at large, and then in due course, some of them break down personally and socially and become public charges.

In 1910 the percentages of nativity groups in the population of the United States were as follows:

Native born, both parents native born	64.47
Native born, one parent native born, one parent foreign born	6.60
Native born, both parents foreign born	14.23
Foreign born	14.70

A variation from these percentages in the institutional quotas among these several groups will indicate for each particular type of social inadequacy, the relative social stabilities of the several groups. Thus, if the *native born, both parents native born*, that is the older American stock, are contributing to institutions more than their quota, and our *foreign born*, or *our native born, with one or two parents foreign born*, are contributing less than their quotas, it would be logical to conclude that the older stock is less stable socially than the newer, or reversed findings would justify the reversed conclusion.

FINDINGS AND ANALYSIS

Now, having set forth the methods and standards of measurement, let us present the findings of the special inquiry. These studies are based upon the

returns from 370 state and federal institutions for the several types of social inadequacy, and cover considerably more than fifty sub-classes of social inadequacy, and cover considerably more than fifty per cent of all institutions of this kind. They are unselected, and the number is limited only because of limited returns secured by the investigation now (September 1, 1921) under way. At the present time, I shall present findings in reference to the male sex only.

1. The feebleminded. In the case of the feebleminded, we find that the *native born, both parents native born,* contributed 88.08 per cent of their quota, whereas the *native born, one parent native born, one parent foreign born,* contributed 198.18 per cent of their quota; the *native born, both parents foreign born,* 174.63 per cent; the *foreign born* only 32.72 per cent. This means of course, that our recent immigration sieve has been fairly effective in preventing the admission of feebleminded persons to the United States, but that the stock from which our immigrants of the past generation came, was of a highly degenerate nature, as shown by the relatively high numbers of their offspring which are today found in institutions for the feebleminded.

2. The insane. In the case of the insane, the situation is somewhat different. The figures are *native, both parents native born,* 64.34 per cent; *native born, one parent native born,* 124.39 per cent; *native born, both parents foreign born,* 106.18 per cent; *foreign born,* 239.25 per cent. This means that whereas our immigration service has been fairly effective in shutting out individual feebleminded persons, it has failed entirely in shutting out the potentially insane. Indeed from the figures given here, it seems as though we have been a dumping ground for this particular class. There is one practical difficulty in shutting out the potentially insane person. Insanity is most apt to appear in middle or later years, whereas with the feebleminded, the ailment is detectable from childhood on. Thus with young immigrants, feeblemindedness is easier than potential insanity to diagnose at Ellis Island. In reference to insanity, the immigrant stocks of a generation ago were only about twice as heavily burdened with insane potentialities as our still older native stock, but in the more recent immigrants insanity is four times as common as in the so-called American blood.

3. The criminalistic. Proceeding to the criminalistic class, the ratios run more parallel with those of the feebleminded than with those of the insane. I shall not give the detailed figures. It will suffice to say that the foreign born have not contributed as high a quota to our reformatories and institutions as our older American stock, but that the highest quota of all is furnished by the *native born, one parent foreign born,* whereas the *native born,*

both parents foreign born, are only a little more degenerate criminalistically than the foreign born. This means that immigrant stock is more criminalistic than the immigrants themselves.

4. The epileptic. With the epileptic, the analysis shows quotas quite similar to the criminalistic group.

5. The inebriate. Present returns are not numerous enough to justify an analysis.

6. The diseased. With the tubercular in institutions, the *native stock* contributed only 72 per cent of its quota, while the *foreign born* contributed 176.46 per cent. There may be an economic factor here that must be considered in further accounting for the relatively high incidence of state charges in the tubercular group, but it is probable that our recent immigrant stock is more susceptible to tuberculosis than the older—regardless of the high incidence of disease in certain old New England families. The second generation of immigrants shows an incidence of tuberculosis almost twice as high as that of older native stock.

Among the leprous the numbers are rather too few to show quota findings effectively, but even here the foreign born have a percentage ratio of more than three times that of our native American stock.

7. The blind. With the blind, the immigration service has been highly effective. Our older American stock contributed 136 per cent of its quota, while our foreign born stock only 12 per cent. Moreover in analyzing the intermediate groups, that is, the *native born with one parent foreign born*, and the *native born with both parents foreign born*, we find that recent immigrant stock has contributed to our institutions for the blind less than one-third the quota offered by the older native stock. Most eye defects are dominant traits and are therefore relatively easy to locate in both the individual and in the stock.

8. The deaf. With the deaf, the figures run quite parallel with those found for the blind.

9. The deformed. With the deformed, the *foreign born* contributed only 7 per cent, but unlike the blind and the deaf, the first generation descendants of immigrants contributed more than fourteen times the quota offered by the foreign born themselves. Thus, while we keep out the deformed immigrants, our immigration laws do not keep out hereditary deformity, but as in the case of tuberculosis, the economic and nutritional factors need special consideration here.

10. The dependent. With the last of the ten classes of social inadequates, the dependent, our American stock shows up unfavorably with the foreign

born, with an incidence in institutional quotas almost twice as great. Moreover, the first generation of descendants from the foreign born show up quite favorably in this respect, compared with the older native stock.

SUMMARY

Let us now summarize all types of social inadequacy. The quota-contributions run as follows:

	per cent
Native, both parents native born	89.08
Native born, one parent native born, one parent foreign born	120.60
Native born, both parents foreign born	104.28
Foreign born	134.42

All of which means that, as a whole, the foreign born population of the United States is contributing to our custodial institutions one and one-third its quota, while our older native stock is contributing only about nine-tenths its percentage allowance. The first generation of descendants of immigrants show a little higher social value than our most recent immigrants, but here also their quotas of degeneracy are so high as to justify the conclusion that within the last generation the inborn physical, mental, and moral qualities of our immigrants have been declining.

CONCLUSION

The lesson is that in order to prevent further deterioration of the American racial values, through undesirable immigration, it is necessary to sort our immigrants on the basis, not only of personal examination, but also on the basis of family stock. In order to do this, it will be necessary to make examination in the home towns from which the immigrants come. As an economic proposition, such examination at home would constitute a great saving in money, over sending the immigrant across the seas for his examination. It would also be much more humane. International complications could probably be avoided by enacting a law which would admit to the United States as immigrants, only persons who can and will supply to the American consul at the port of debarkation, family history records demonstrating soundness of stock—mentally, physically and morally—sufficient to meet the eugenical standard set by the American statute. This, of course, would constitute a limitation in addition to those based upon considerations other than eugenical. Second, our laws should be modified in order to permit the deportation of all aliens who become public charges. At present the law does not permit deportation after five years of residence in the United States, regardless of conduct or social or racial values.

THE ECONOMIC FACTOR IN THE PROBLEM OF EUGENICS

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Whatever effect the economic factor has on the phenomena of eugenics is exercised mainly along the lines indicated in the following outline:

I. The direct influence of the struggle for livelihood upon the quality of population:
   1. Of the world as a whole.
   2. Of each nation.
   3. Of sectional groups.
   4. Of social classes.

II. The determination of the range of selection in mating, as affected by:
   1. The mobility of population.
   2. The requirements of social class.
   3. The fixation of approved types.

III. The determination of marital type, as between monogamy, polygamy, polyandry, promiscuity.

IV. The determination of the occurrence of marriage, as to:
   1. Proportion of population marrying.
   2. Age of marriage.
   3. Divorce and remarriage.

V. The determination of the birth-rate, as between:
   1. Regional groups.
   2. Social classes.
   3. Age groups.

VI. Determination of mortality:
   1. Juvenile mortality.
   2. Duration of life, as comparing:
      a. Social classes.
      b. National groups.

In the long run the character of the whole population of the world has been shaped by the selective influence of the struggle for subsistence. The evolutionary process continually tends to eliminate persons insufficiently industrious, or enterprising, or adaptable, or aggressive, or sycophantic. The economic process has always put a premium on appropriate qualities and has operated in the direction of the extermination of deficient strains. The working of economic selection has varied from land to land, from group to group, from class to class. It tends to become more diversified and

flexible, but in last analysis it has always been the basic determinant of the population qualities with which eugenics has to deal.

The population of the United States is especially a product of economic selection. In the period of discovery and to a large degree since, Europe has been hard pressed. The result has been an intense conflict of classes, which accounts for most of the political and religious cleavage as well as for the avowedly economic antagonisms of modern times. In particular, the era of American colonization was the era of the rise of the bourgeoisie, which expressed itself religiously in Protestantism and politically in parliamentarism. America became in the main an economic project of this new economic class, alert to every prudential opportunity to evade, when it could not for the moment crush, the hostility of the landed aristocracy which it was destined to supersede. Virginia was opened as such an economic venture. So was Massachusetts. Even the Pilgrims were actuated directly by the desire to find a competence for the children, and their enterprise was mortgaged to financiers who smoothed the way. The whole appeal of America has always been primarily economic, and whatever political freedom and religious tolerance may have existed as additional attractions were due chiefly to the ample room and wide economic leeway which made European differences matters of indifference. Thus the migration to America has always been a matter of economic selection, appealing to special types of enterprise, or to those whose essential life interests complicated the problem of prosperity across the seas. On the whole, the dominant influence in the making of America has been overwhelmingly bourgeois, and the population has been selected by the requirements of the capitalist regime.

The introduction of the race problem into America was obviously the result of this cool business calculation. The reason why we have an African problem rather than an Indian problem hinges on the fact that the red man proved ill-adapted to the economic requirements of the exploitative white man. The sectional localization of the problem is also entirely due to the difference in economic possibilities of North and South in earlier days.

The important population differences between East and West, between the older and newer sections of the country, are also functions of the problem of livelihood. There were successive layers of pioneering, each drawing a special type: the hunter and fisher and trapper; the maker of clearings; the settled farmer type: the business and industrial classes. The range of opportunity effected groupings according to tastes, and drew from the older settlements persons of appropriate dispositions, leaving behind other types indisposed to the vicissitudes of the frontier. There was a continual back-

wash, also, of persons who found they had miscalculated their aptitude for the pioneer systems of livelihood. Naturally the whole process resulted in a serious disturbance of the balance of the sexes, so that the West had a dearth of women and the East a superfluity. All of these circumstances affected profoundly the quality of populations.

Thus it is clear that not merely the general character of the raw material on which eugenics may work, but also the localization of its varieties is in large degree determined by economic exigencies. The same may be said of its social stratification, for on the whole the only real basis for social class is divergence of economic status.

But mating does not take place at random throughout the whole population of the world, or of any region, or any class. For one thing, a great deal always depends on the mobility of population. Now it requires no argument to show that the whole apparatus of transit and the whole habit of free movement from place to place has grown up as a part of the economic process. America, particularly, is noted for the readiness of its people to roam, and the roaming is usually on an economic quest. The result has been a fluidity of population that has resulted in an enormous range of intermixture of population as compared with what occurs in a sessile old world community. The relative abundance of economic opportunity in the New World has also operated in the direction of social equality, which is another important influence in broadening the range of choice in mating.

The particular type of husband or wife that will be selected from the available and permissible supply, depends likewise in great measure on economic circumstance, as illustrated by the contrast between the type of wife selected by the artificial standards of an aristocracy of wealth and that chosen by the pioneer, who must have a woman able to heave one end of a log. Each economic level of social development or social stratification tends to fasten upon a rather definite type of person to be preferred as husband or as wife, and the resultant mating is not without its influence upon the race.

The question as to the prevalence of monogamy or polygamy is also closely related to economic circumstances, which influence thereby the occurrence of parenthood and the details of crossing. Polyandry, whether of the sanctioned sort as among some primitive peoples, or of the illicit sort called prostitution is correlated with economic privation which makes it difficult if not impossible for each man to support a household of his own. Polygamy belongs with an economic condition in which a multiplicity of wives is required either as instruments of production, or as means for the practice of distinguished consumption of wealth. Female chastity has been

in the main the result of a male-controlled system of property, requiring legitimate heirs and averse to the support of other men's children. The spiritual sanctions are an afterthought. It is improbable that real promiscuity was ever an established system of intercourse among human beings, but the narrowing down of mating is closely correlated with the limitations inherent in a system of private property. Whether monogamy could prevail under the projected communism would depend on whether some sort of ideal sanction can be developed to take the place of the economic controls.

In pioneer American society, hardly any person chose to remain single. There were no bachelor apartments, no laundries, no hospitals, and for the woman there was no means of livelihood outside marriage. Of course the tendency of westward migration was to produce a quantum of mateless men in the West and mateless women in the East, so that a veritable traffic in women arose as a means of partial adjustment. In our modern society, there are so many ways of supplying the ordinary needs of life without a helpmeet that the tendency is to increase the number of those abstaining from marriage and procreation. The age of marriage of such as do marry is also increased as wife and children become more of a burden under the economic circumstances of an urban industrial society. A good deal depends of course on whether or not a couple's economic circumstances put them in a class in which it is unseemly for married women to work for pay, or to perform, in person, the duties of the household. The age of marriage is of course an important consideration in view of the differences in children born to younger or older parents.

Much depends, also, on the prevalence of divorce, and of remarriage. There is a correlation between divorce and childlessness, and facility of remarriage tends to greater procreation. Now the growth of divorce is correlated with the economic evolution which reduces the importance of the family as a system of production and consumption, and particularly with the arrival of economic opportunity for women, so that they are free to cut loose from undesired husbands.

The fact that some geographic or social groups have much lower fecundity than others depends to a great degree on economic considerations. The age of marriage and the frequency of marriage is one item, but the economic outlook affects directly the number of children, at least in cases where birth control is understood. Now birth control is a prerogative of economic privilege, or else a social policy based on an economic logic. We may presume that the official tolerance of birth control in the Netherlands is dictated by the limited resources of the country and its inability to force a place in the sun. The taboo on the general diffusion of contraconceptive

information in the United States is logically traceable to the fact that the country is still underpeopled and that the capitalist interests require a considerable increase of producers and consumers. The industrial capitalist wants an abundant supply of labor, and the landlord wants a dense population that will raise land values. It is said that a representative of New York landed interests appeared before the legislature and argued against birth control on the score that every child born in New York City added a thousand dollars to land values. The economically endowed classes have, of course complete command of the means of prevention, but these must be withheld from the proletariat.

The age at which parents will have their children is controlled largely by economic conditions. In a pioneer society of crude plenty, where even the young child can be of use, children commence to come before the parents have attained maturity. The same thing is true of those stages of industrial development that exploit child-labor, and that put the period of greatest parental earning power in the early twenties. As the population gets farther away from the soil, as the bearing, feeding, and education of children becomes an expense, the age of parenthood tends to be postponed, and the quality of the race is influenced thereby, both by the difference made by the greater age of parenthood and by the fact that not all elements of society are equally affected by the tendency.

It is important also to know what proportion of children grow to maturity, for juvenile mortality is almost equivalent to race suicide. The death rate of children in different countries and classes is pretty directly a function of economic well-being. The average duration of life as between classes is also to be considered, as affecting the opportunity for parenthood. The greater length of life of certain economically sheltered classes compensates to some extent for their lower birth-rate, and tends partially to counteract the lateness of their marriage.

There is not room within the limits of this paper to follow out all the suggestions as to the ramifications of the economic factor throughout the field of eugenics. If it seems that economics has been overemphasized, I am willing to concede that the seeming weight of the considerations I have set forth may, perhaps, be considerably neutralized by the possibility that many or most of the traits which come within the sphere of the economic selection herein described may not be matters of heredity at all, but may be transmitted by social contact; or at any rate, that the distribution of characteristic traits bears little or no relation to the national, or racial, or class lines of human society. I have never seen convincing scientific evidence that the differences between races, nations, social classes in the

matter of hereditary endowment are crucial. In so far as such groups are not eugenic or dysgenic categories, the argument of this paper will have to be modified in so far as it presumes that the social group cleavages are in themselves significant for the purpose of the eugenicist.

It can scarcely be doubted, however, that, making whatever allowance may be necessary for the distinction between inherent traits capable of being worked upon by eugenics, and characteristics attributable to what is called social heredity, which falls outside the sphere of our study, the control of economic conditions must be included within the apparatus of eugenics. Indeed it is my impression that for the time being the average quality of normal humanity the world over is good enough at birth for all practical purposes, and that the present rôle of eugenics must necessarily be very limited as compared with the urgent problem of bringing to pass a workable and adequate economic order favorable to the development of such enlightenment as will make a positive and constructive eugenics possible.

EUGENICS AND SOCIAL ATTITUDES

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It is no mere rhetorical indulgence to say that the mechanico-commercial and nationalistic society which developed with such amazing rapidity and to such disastrous complexity between the fall of Napoleon and that of the Kaiser has now become a Frankenstein which threatens our destruction.

The unmanageableness of this great Society is the result neither of malevolence nor of exceptional stupidity. From causes easy to understand, it carries within itself certain fundamental bio-psychic and cultural incompatibilities which will continue to strangle its functional power until they are removed. These incompatibilities arise primarily from the fact that our intellectual achievement in the field of applied physical science has far outrun our rational control of social relations and our moral development, which has been held back by the persistence both of certain instincts and of traditional habits of thought and attitude.

During the long ages of our biological and early social evolution, instincts of fear, pugnacity, self-assertion, self-abasement, and acquisition were developed to great strength and wide distribution, as requisites of survival in the universal struggle for existence. The less individualistic instincts, sympathy, gregariousness, workmanship, and other tendencies to constructive self-expression, were subordinated to powerful impulses of combat and destruction. We thus have inherited, probably both biologically and socially, a negating, obstructive psychology of conflict and intolerant self-assertion instead of what we must have, a psychology of coöperative workmanship, objective understanding, and sympathetic good will.

To our untoward biological instincts have been added historical accretions in the way of attitudes, habits, complexes, and philosophies equally incompatible with the requisites for a workable and worthy human association in a society as large and complex as ours must continue to be. We are specifically the victims of a social inheritance of political and economic individualism carried over from the eighteenth century revolt, when the emphasis was on individual rights rather than where it must now be put, upon social function.

Contrary to the general trend of sentiment among orthodox eugenists, I venture to think that the main cause of our failure to make the great Society safe for human life, freedom, and happiness, lies not in deficient mental capacity but in a lack of will and of the right attitudes. We have simply failed to develop motives and attitudes—a morality—suited to the task.

In the face of these profound maladjustments, where should the present interest of eugenics lie? If what I have stated is true—and I could support it by ample evidence if there were time—the first and mandatory task of eugenics is to bring to bear all the scientific and educative forces at its command for the development of attitudes more compatible with the successful functioning of the now unwieldy and dangerous social mechanism to which the present generation has been surrendered by those who have gone before.

Here are our specific tasks: (1) to develop all the intellectual capacity we have, (2) to free knowledge from censorship of any kind, (3) to acquire in the general population as quickly as possible the scientific attitude, which will free us both from reactionary fear and emotional radicalism, (4) to develop sympathy and mutual tolerance and understanding, (5) to acquire a morality of self respect, such that the privileged will cease to cling to their right of parasitism and the masses refuse to be subservient means to any end not inclusive of themselves; finally and fundamentally, (6) to substitute workmanship for acquisitiveness, coöperation for conflict, good will for bad.

If your answer to this is that it sounds like changing human nature, my answer is, Yes, it is—just that; and that is precisely the aim and the dream of eugenics.

The central theme of eugenics literature hitherto, however, has been the inheritance of physical and intellectual defect and capacity. You will find running through it all the assumption that the primary desideratum is individual mental ability. You will find practically no recognition that motivation, attitude, direction of the functioning of capacity, are quite as important as capacity itself. The biological and medical interests, which have dominated eugenics research, have been all too negligent of the significant contributions that social and behavioristic psychology and psychoanalysis may confidently be expected to make to the problem.

Nothing could be farther from the truth than the assumption which so many eugenists seem to make that if we could only get uniform health and physical vigor and a universal biological inheritance of "normal" mentality, i.e., capacity, the one needful foundation for social health and efficiency would have been laid. The war and the present world situation should

convince us that no amount of intellectual power will suffice in the absence of really civilized, socialized attitudes.

Unless it can be shown that the necessary attitudes can be secured through a process of selective breeding, and that quickly, biological eugenics must remain largely an academic amusement, pursuing researches that may ultimately be important, but, for the pressing needs of the present, futile, and without appreciable influence.

Suppose it were possible to put a program of genetic eugenics into wide application at once, breeding for better brain power. That power, in the absence of a profound change in our attitudes, would continue to function primarily in the service of the combative and acquisitive instincts, to aid in the amassment of individual and corporate wealth, the perpetuation of nationalistic frictions, and very likely an indefinite series of world wars. How then would our condition be improved?

Are you able to suppose that, leaving the attitudes of the propertied middle classes what they now are, a middle class birth rate equal to that of the working classes would bring us nearer a peaceful operation of the great Society? Or that, indefinitely perpetuating the philosophy of self-help and individual rights, and proceeding to breed a race of highly intelligent workers, industrial unrest would diminish? Should we not have in either case an intensification of class animosities?

And is it not tolerably clear that even should the case for a sweeping program of genetic eugenics be put on an indisputable scientific basis, the possibility of carrying out any such program would be conditioned by the general diffusion of the requisite social attitudes in the population at large?

So far as attitudes incompatible with a worthy and workable society are the outgrowth of traditional, hold-over political and economic philosophies, they can be gradually transformed through persistent education. But so far as they are rooted in instinctive inheritance they can be eliminated only through social selection. Time alone can tell to what extent our perverse attitudes are thus rooted. But this is sure: before any effective artificial selection for a more socially instinctivated population is attempted, we must promote every movement that will give freedom and force to the expression of the social instincts which we have—especially sympathy and workmanship—and remove the cultural obstacles to toleration, co-operation, and the sense of social obligation.

We shall ultimately probably learn that reversed social selection, and undesirable assortative mating play a much larger part than we now realize in the perpetuation of temperamental types and attitudes maladapted to the requirements of the Great Society. Undesirable assortative mating

is due to a considerable extent to the limitations imposed by class lines. How far assortative mating is responsible for the perpetuation of hidebound, unsocial, reactionary and selfishly conservative attitudes in one class, and headlong, emotional, pugnacious revolt attitudes in another, it is impossible to say. It might be worth investigation. Be that as it may, the bad effects of assortative mating are perpetuated not alone through organic heredity but far more, probably, through the perpetuation of unstimulative and depressing family environments and undesirable acquired attitudes.

In view of such considerations as I have tried to suggest, necessarily in merest outline, it appears to me that the main attention of eugenists—of all but the most highly specialized genetic investigators—should now be directed primarily to the environmental causes of these obstructive social attitudes, and to the cultural means to their elimination. Such a shifting of attention and effort will by no means be contrary to the broader spirit of eugenics as conceived by its founder. For we need to keep in mind that Francis Galton defined eugenics not only as "the science which deals with all influences that improve the inborn qualities of the race" but "also with those that develop them to the utmost advantage."[1] Inasmuch as Galton's work, and the work of most of the men who took their inspiration from his leadership, fell within the period when biology was going through its most striking development and when it was having a most profound influence on sociological theory and social ideals, it is not strange that Galton and his followers lost sight of the second half of his definition and that some contemporary scholars like Pearson in England and Davenport in America have practically denied significance to environmental influence and ontogenetic development. Today, however, with the advances continually being made in behavioristic psychology, social psychology, and psychoanalysis, we should be more than unscientific did we not turn attention back to the neglected half of the definition and of the task of eugenics in this broader sense.

The psychology of today is largely a psychology of motivation and attitude. While we may agree with Pearson[2] that natural capacity—"good steel," is restricted mainly to a relatively small part of the population, or with Ward[3] that it is widely distributed, we are in position to see that whatever its amount and distribution, much of it not only fails to be discovered and utilized, but that even when sharpened and polished it is put to uneconomical and unsocial uses through wrong motivation, wrong attitudes, and archaic philosophies.

[1] Eugenics: Its Definition, Scope, and Aims, in Sociological Papers, 1904, p. 45.
[2] The Groundwork of Eugenics, 2d edition, 1921, pp. 36 ff.
[3] Lester F. Ward, Applied Sociology, 1906, chs. 9, 10.

We cannot afford to continue the error, tactical as well as theoretical, of supposing that the psycho-physical elite and the economic elite are coterminous.[4] Nor must we suppose that all the cacogenic elements are to be found in the lower social ranks of our population.

Paradoxically, the real dysgenic element of our population today, so far as acquired social attitudes are concerned, the element most obstructive of social progress, is to be found in strongest force not in the classes where it is usually assumed to lie, but in the well-to-do, middle classes. It is here that we find the unquestioning acceptance of archaic philosophies and a hypertrophy of the unsocial instincts of acquisition and combat and of class consciousness. Here, more than anywhere else, individualistic social selection has put a premium on commercial "success," upon inability or unwillingness too closely to distinguish between production and predation, and upon worship at the golden sign of the dollar. Here, too, the cult of conventional mediocrity, conservative stolidity, and Victorian respectability hold sway.

And it is in this class perhaps quite as much as among the manual laboring masses or among the privileged ultra-wealthy that a broad-horizoned eugenics has a part to play. That part does not end with stimulating a higher middle-class birth rate—a very doubtful expedient at best. The perpetuation of archaic attitudes, the transfer from one generation to another of self-satisfied mediocrity and self-centered individualistic philistinism—the level of "Main Street" and ten thousand gopher prairies—is not due to deficiency in native mental capacity. It is due mainly to the centrally important fact that here in the middle classes the whole weight of antiquated conventions, ideals, attitudes, and institutions is thrown with least relief and counteraction upon relatively defenseless youth.

It must be the task and function of social vision and rational reconstruction to remove that weight, and give the social instincts of youth a chance for expression. And to that end eugenists should work with all their resources for the retirement to private life of public officials who in one breath preach economy and in the next approve the squandering on naval programs and chemical warfare divisions of the billions of dollars which should go to the development of educational facilities adequate to the needs of a great Society now so sorely distraught. The education to be thus supported must not be of the formalistic type now current from the grades to the university. It must be an education not only of intellectual capacities but such an education and liberalizing of human attitudes as will

[4] See Loria, The Psycho-physical Elite and the Economic Elite, Problems in Eugenics. Papers presented to the First International Eugenics Congress, London, 1912.

subordinate acquisitiveness and combativeness to social workmanship and constructive, purposive, and sympathetic social coöperation for broad, tolerant, and forward-looking social ends. In default of a profound change in our social attitudes not all the intellectual education and development in the world can make the great Society workable in the service of worthy human purposes. Ultimately some artificial direction of social selection, especially of assortative mating, will be called for, but before that, the pressing task, and the only practical way of shifting our social attitudes, lies in a much more adequately supported, a better conceived, and a much more socially functional education than we have as yet begun to approach.

THE NATURE-NURTURE ISSUE IN ITS BEARING ON GOVERNMENT

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I. THE PRESENT STATE OF GOVERNMENT

To the student of government the present political situation throughout the world offers a striking spectacle. We are faced not only by those forms of protest which derive their impulse from a desire to overthrow existing institutions of government—by Communism, by Syndicalism, by Bolshevism, and by the various brands of Socialism—but also by a growing sense of exasperation and helplessness amongst those who wish to obtain relief from the prevailing distress by reforming the political systems which we now employ as agents for carrying out our social purposes.

A very brief examination of the course of political evolution in modern times raises in every intelligent and candid mind the question of what it is that has so intrigued the advance of popular government that politics is left to be the only phase of human activity of which it can be said that during the past hundred years it has not made notable progress toward the attainment of its objects.

The specific abuses which in the eighteenth century led to the American War of Independence and to the French Revolution, which in the nineteenth century led to the movement for parliamentary reform in England and to the revolt of the Spanish-American Colonies, and which in the twentieth century have already, in less than two decades, produced the Russian Revolution and the Chinese Revolution, suggested to the leaders of these enterprises that future immunity from mis-government would be assured if the people were allowed to participate in government, to make their influence determine the aims which Government should pursue, and to exercise a vigilant supervision over the methods employed in their pursuit.

Of this popular participation in government we have had nearly a century in England and nearly a century and a half in the United States. Throughout even the shorter of these periods there is to be observed a continuous and noteworthy improvement in the general conditions of human life. In food, in housing, in clothing, in transportation, in medicine, in surgery, in

means of communication between man and man, the health, the convenience the comfort, and the luxury of the people have been ministered to with an ever-increasing measure of efficiency. When we turn to the field of government, however, we are confronted with the startling circumstance that there are few countries in the world in which popular discontent with government has not reached a point where existing political institutions are threatened with profound modifications, if not with total destruction.

A contrast so impressive between the progress of society and the progress of politics cannot have its origin in temporary or in adventitious causes; it must be traceable to the operation of some elemental factor associated with the progressive development of man. This factor is *Truth.* The failure of government to keep pace with the general advance of humanity is, in my judgement, due to this, that the general advance of humanity has been effected solely through the acceptance of ascertained truth as the basis of action, whereas in relation to government we not only decline to seek truth, but, when it is thrust upon us, we reject it as a source of guidance, and insist upon moulding our action upon prejudice, tradition, sentiment, self-interest, on anything, in fact, except on a diligent research into that voluminous record of the aims, the methods, and the results of government which lies open to our inspection in the governmental experiments of a score of countries.

In matters pertaining to government we are, to put the matter bluntly, fugitives from truth. It is for this reason that our present political practice is no better fitted to the times than would be the medical practice of a physician who, in this year of grace, should prescribe the "king's touch" for scrofula.

This occasion is not one on which it would be appropriate to embark upon a summary review of the terrible consequences which have flowed from our neglect to apply to the problems of government that method of rigorous scientific investigation which has proved to be so potent in solving every problem to which it has been applied.

I propose to discuss, with what brevity the nature of the subject permits, three points in regard to which scientific enquiry will have to be addressed, and the results made the basis of a broad educational campaign, if popular government is to be saved from the fate which will overtake it when, in despair of making our present political systems the efficient instruments of social progress, the people turn for hope to the specious promises of the radical extremists.

II. THE NATURE OF POLITICAL RIGHTS

In the voluminous material which has accumulated around the definition of political rights no more than incidental reference has been made, so far as I am aware, to a highly important distinction in which is involved all that is vital to the success of popular government. This distinction is that which exists between a right to receive the services which government renders to its citizens and a right to take part in rendering these services. It should need no argument to prove that although, viewed from the standpoint of their common citizenship, all citizens are equally entitled to the services which Government performs, they are, viewed from the standpoint of the very marked differences in their character and ability, by no means equally entitled to perform these services, or equally qualified to select those who are to perform them.

A simple analogy suggests itself. Two men are in a hospital. One is a patient lying on a bed, the other is a surgeon standing by his side. Now, in respect of a right to have a diseased appendix removed these two men are equal; but in respect of any right the one has to remove the other's appendix, or to select someone to remove it, they are obviously unequal.

If we examine the present state of government in the light of this analogy it is easy to understand why, through our failure to distinguish between these two kinds of rights, the administration of popular government has reached its present condition of extravagance and inefficiency.

This difference of right was clearly recognized during the colonial period of American history. A property qualification for voters was set up in Massachusetts, New Hampshire, and Connecticut as early as 1630; and this example was followed by all the other colonies. The principle involved was concisely stated by Virginia, which restricted the suffrage "to such as by their estates, real or personal, have interest enough to tye them the endeavor of the public good." It is important to bear in mind that the property qualifications for voters was not imposed on the colonial political system by England, but was adopted freely by the colonists themselves.

There existed, then, in colonial days, two kinds of citizenship, a passive and an active, each receiving the protection and other services of government, but only the latter taking any part in governance. The gradual abandonment of this distinction, through the successive lowerings and final extinction of voting qualifications, is familiar to all students of politics, and need not here be dealt with. It is interesting, however, to recall the words employed by an eminent jurist before the New York Constitutional Convention of 1821. Chancellor Kent, addressing himself to the question of manhood suffrage, said:

> It has been regarded with terror by the wise men of every age, because in every European republic, ancient and modern, in which it has been tried, it has terminated disastrously and been productive of corruption, injustice, violence, and tyranny . . . . the tendency of universal suffrage is to jeopardize the rights of property and the principle of liberty.

This declaration sounded the key-note of the opposition to manhood suffrage. The fear about the principle of liberty was an echo of the issue on which the American Revolution had been fought; the fear about the rights of property was an echo of the events which followed the outbreak of the French Revolution, and which were fresh in the memory of men then in their prime.

It is highly significant that in all the controversies which arose out of the proposal to establish manhood suffrage in the United States, no prominence was given to the effect it might be expected to have on the administrative functions of government. Nothing could have been more natural in view of the general conception of government which was universally prevalent at that time. Government was not in those days regarded as a service organization but as a power organization. It was almost always discussed with reference to its paramount duty to employ its power in protecting individual rights, whether to the possession of property or to the enjoyment of personal liberty.

I have failed to discover in the political literature of the period any definite proposal that the political machinery of government should be employed as the instrument for carrying out a programme of social progress. This leads to the question of what were, in fact, the purposes, which the framers of popular constitutions had in mind when they designed the political machinery of popular government.

III. THE POWER-ELEMENT AND THE SERVICE-ELEMENT IN GOVERNMENT

It is to be observed that all governments of the so-called popular type have been founded in respect of a single problem, the relocation of power in the State. Thus, the English Revolution of 1688 and the French Revolution of 1789 took power from the sovereign and located it in parliamentary bodies; the American Revolution took power from the English sovereign, legislature, and courts and located it with the federal and state governments on this side of the Atlantic; the revolt of the Spanish-American Colonies took power from the king and Cortez of Spain and located it in the governments of Central and South America.

Now, at the time when these transfers of power were effected, governments were regarded as mere will-organizations which, if their powers were not to be abused to the gross impairment of individual rights, had to be kept within bounds by the restraining hand of popular control. Government in those days had few service-elements; the people were concerned almost exclusively with what government *should not do to them;* the idea that government should do things for them found no place in the public mind. The conception of eighteenth century government as a mere will-organization, strongly disposed to make an arbitrary use of its power, stands out with striking distinctness in the Declaration of Independence. The indictment of George III is made up exclusively of evil things he had done *to* the colonists; there is not a line which suggests that there were good things which he should have done *for* them, and which he had failed to do. In the most impressive passage of the Declaration the sole aim of government is declared to be the securing to the people of certain individual rights —to life, to liberty, and to the pursuit of happiness—and, since rights are chiefly imperilled by the uncontrolled exercise of power, the cardinal principle of popular government is stated to be that governments derive their just powers from the consent of the governed.

That the preservation of individual rights and not the performance of public service was the problem for which popular constitutions were to find the solution is proved beyond question by the structural form of the government agencies which these constitutions established, and by the nature of the functions assigned to them.

Everything is designed with a view to making the abuse of power difficult; but in so far as these arrangements are effective in making difficult the abuse of power to the individual detriment, they are equally effective in making difficult the use of power for the public benefit.

If we take the federal government of the United States as an example it is easy to see that the Constitution makes it difficult, in times of peace, for the Federal power to exert itself against the individual rights of citizens. For instance, a bill directed against free speech must first pass both houses of Congress, must then be submitted to the risk of an executive veto, and would, on being put in force, be taken before the Supreme Court for a test of its constitutionality.

There is afforded, indeed, by this plan a considerable measure of protection for individual rights; but reflect how utterly unsuitable the whole arrangement is when the object is not to prevent government action against the rights of citizens, but to facilitate government action in serving the needs of citizens.

The rights of citizens can be clearly defined, any assault upon them can be accurately described, can be proved by evidence, and can be punished according to legal rules laid down in advance of the occasion. These rights are, in law, common to all citizens; they do not vary with latitude or with longitude; they are the same for the rich and the poor, for the agriculturist and the mechanic; their preservation is a duty laid upon each of the Governments of which the United States is composed; the strongest bulwark, of their defence is the interested scrutiny to which a party out of power subjects the acts of a party in power.

There is a circumstance connected with the maintenance of citizen-rights which distinguishes that task from every other task undertaken by government, namely that neither in respect of the rights themselves nor in respect of any question which can arise with reference to their enforcement are there involved any intricate technical considerations which exclude the average citizen from a full understanding of the points at issue.

Noteworthy as are these characteristics of the connection between the citizen as the possessor of rights and Government as their guardian, their importance is overshadowed by another element in the situation. Upon the affair of confirming the people in the enjoyment of their rights government always acts in response to a mandate clear, universal, and perpetual. No citizen has ever attacked a government because it protected his rights.

Contrast all this with the position which develops the moment government adds to its appointed rôle of guardian of the people's rights that of agent of the people's purposes—when, in a word, government begins to employ as a motor, a machine intended to be used as a brake.

Every matter upon which government is called to take action as the agent of the people's will is complicated by the existence of a serious conflict of interest between different groups of citizens —between town dwellers and country dwellers, between an employing class and an employed class, between the industrial and the agricultural population, between a supine and indifferent majority and a determined and heavily financed minority, to go no further. The complications arising from this diversity of interest is mutiplied a hundred-fold by an internal conflict within each of the groups, between the intelligent and the unintelligent units.

Faced with such conditions, in what direction does government turn to receive the instructions upon which it is to act? It can turn only in one direction, toward whichever group appears to control enough votes to confer upon the government, as the reward of its complaisance, a renewed lease of power.

Even if party expediency, as the guiding motive of government action, could be made to coincide with the general public interest, there would still

remain in the path of achievement an obstacle which would balk the attainment of any purpose however laudable. Given a definite aim—such as the stamping out of monopolistic industry, or the reform of legal procedure—no people living under popular government has ever been educated to perceive the necessity of adopting a scientific technique in converting its purpose from an ideal into a reality. Yet nothing is so easy as to define an ideal in terms of your desire: nothing so difficult as to devise a plan which will give it practical effect.

The problems of modern government are the same the world over. There is no aim which has not been the subject of experiment in a score of countries. But no popular government has ever been called upon by its citizens to establish for the accumulation of the records of all these experiments, a central depository, equipped with a highly expert analytical staff competent to present a clear statement of the methods followed and of the results obtained in the efforts made by all governments to give effect to the will of the people.

We have demanded in every other field of human activity the development of a highly skilled professional technique; we have been content to leave the whole range of the constructive activities of government to a technique which, had it been imposed upon the other arts and sciences, would have condemned mankind to remain for ever in the stone age.

Now, Ladies and Gentlemen, the brief sketch I have made of the present state of government raises a question which may very properly be laid before this Congress.

A government of the people by the people can reflect, as well in relation to its methods as to its aims, only those qualities which belong to the individual citizen. Since, however, every State is composed of citizens amongst whom mortality and intelligence are very unevenly distributed, it is of the highest consequence that we should know by what forces the moral and intellectual qualities of the individual citizen are determined.

Two hypotheses are in the field; one, that in the main we derive our qualities from our progenitors, by gametic transmission; the other that in the main we derive them from influences to which we are subjected after we are born into the world. Popular opinion is overwhelmingly in favor of the latter view; scientific judgment is overwhelmingly in favor of the former.

It is clear that since government derives its qualities from the qualities of the voters, no undertaking connected with the study of government can be more vital to the success of popular rule than to determine conclusively the source from which the voter derives the qualities which he imparts to government.

Until we know beyond question whether people are what they are *chiefly* because their forbears were what they were, or are what they are *chiefly* because their contemporaries do to them what they do to them we cannot know whether or not we are trying to force a thousand-dollar education into a one-dollar boy; whether or not our immigration laws are leading, or have already led, to a fatal corruption of American blood; whether or not our criminal laws are filling our jails when they should be filling our hospitals; whether or not there is any ground for hope that government by *all* the people may some day lead to the intelligent expenditure for the public good of a national, state, and municipal income which reaches an annual total measured in billions of dollars.

I commend, therefore, to the serious attention of the Congress the enterprise of appointing a committee charged to investigate and to report on the present status of the heredity-environment issue, to suggest such measures as may be needed to fill the present gaps in our knowledge, and to formulate a plan for the dissemination of scientific information on the subject to all educational institutions throughout the world.

By undertaking a task of this character the Second International Congress of Eugenics would render the world a double service. It would not only place at the disposal of students of government an authoritative statement of our knowledge about one of the most important factors in social progress, but would also give a most wholesome stimulus to the efforts of those who are trying to make people see the urgent necessity of approaching the problems of Government in a scientific spirit.

What between the pressure put upon government from without to undertake everything which used formerly to be considered as lying wholly outside the proper scope of official interference, and the pressure set up with in government to enlarge its functions and to engross its authority, it has come to this that government is now the judge, the jury, the witness and the executioner of its citizens not only in respect of such of their actions as are affected with a public quality, but even in respect of their personal tastes, habits, and opinions.

It is this pervasion of the whole extent of our daily life by the agents of government—by those who make law, by those who administer law, by those who punish its infraction, by this vast army of legislators, commissioners, judges, magistrates, policemen, secret service agents, inspectors, and investigators—it is this which makes it imperative, if we are not to be governed to our total destruction, that the omnipresent activity of government should be guided by the light of scientific knowledge, and conducted through the instrumentality of a scientific method.

EUGENICS IN INTERNATIONAL AFFAIRS

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After the first International Eugenics Congress was held in London in 1912, an effort was made to establish a permanent international committee to continue its work, but its activities were interrupted by the War.

The result, however, of that international disturbance has been to develop what may be called the international sense among the peoples of the world. Scientists, who had already appreciated that national boundaries do not place the limit to their researches, may naturally welcome this more general recognition of the international character of knowledge. Undoubtedly the Congress in New York will mark a step forward in this direction among eugenists. The process of evolution of international organization varies, but follows certain broad general lines. Its basis is a desire to meet fellow workers in the same field, who have been known to each other, perhaps for years, by their writings or other researches and an appreciation of the value of union in a common effort. From such a gathering there results, as from the Congress of 1912, a movement to create steps to maintain that connection. So there gradually arises a permanent organization bureau, office, council or committee,—housed after a time, in a permanent building. Such a center facilitates collective effort by means of combined investigations, statistical inquiries, bibliographical information and publications. Steps are taken to make the personnel more representative and in due course the central organization is sufficiently appreciated to secure Government recognition by the appointment of an official representative. From that stage the acts of the international body become more important and may even be followed by national enforcement through the laws of some countries or receive the imprimatur of an international convention to which all give their assent. Mr. H. C. Hicks, the brilliant librarian of Columbia University, is fully entitled to claim that by such means international coöperation "has tended to offset the dangers of unrestrained state ambition."[1] Moreover, many on the other side of the Atlantic as well as on his own are willing to support his contention that such coöperation "may turn out to be more

[1] The New World Order, p. 15.

important" than matters like disarmament, arbitration, and the Assembly, Council, and Secretariat upon which the protagonists of the League of Nations are disposed to lay more emphasis.

It is desirable, therefore, to consider what may be the position of eugenics in international affairs. At first sight it may be thought that as the primary object of eugenics is the improvement of the race, so its natural place is in connection with the international health organization, but the programme of the second congress shows that the subject has a wider bearing. The third section is to consider in connection with human racial differences the migration of races, and the influence of racial characteristics on human history. The United States and the British Empire alike are faced with problems of far-reaching importance due to racial conflict. It is not too much to say that *there is no subject of more vital importance at the present time* to the nations of the world and it is certainly a question to the solution of which eugenics may make a contribution. May we assume "the unity of the human race and the absence of any inherent superiority or inferiority in any division" and that "the several racial types are variations round a normal human type and express the results of natural mutations preserved by favourable environments?"[2] Or can science maintain the Aryan claim to superiority over savage races? Settlements of international problems may be reached by statesmen and politicians but ultimately the deciding factor is the capacity of different nations to live in unity and no settlement of two peoples within one territory can be permanent unless intermarriage is possible and the conditions which make it so are within the province of the student of eugenics. The fourth section of the Congress also in its discussion of eugenics in relation to the State, to society and to education will be dealing with matters of importance in international affairs. It is clear, therefore, that an affiliation of the International Eugenics Congress to the International Health Office would only represent a portion of the contribution which eugenics may make to the progress of humanity.

Sir John Macdonell in one of those suggestive papers, for which he was so justly noted, presented to the English Eugenics Education Society some years ago,[3] some points which may be recalled in this connection. He summed them up in his concluding peroration:

> Should scientific research tend to show that there are no valid reasons against unions between certain races, physically different; should it go further and say that new unions are desirable and propitious; should it declare that certain stocks would be enriched and strengthened by infusions of blood of less advanced people, then the outlook for races now dying out, brightens; then, perhaps, we should all be in a new sense "citizens of a better

[2] The Round Table, March, 1921, p. 321.

[3] Eugenics Review, January, 1916, p. 246.

world;" then the unity of humanity would have a new, and, perhaps, for the first time, real meaning. There will then be, also for the first time, a rational *jus connunbii* such as neither Roman law nor any other conceived. Hitherto men have walked as to these matters in darkness. Who knows but that your science may show how by wise crossing, the backward races may be levelled up without the advanced being debased? Who knows but that it may be the solvent of the pride and intolerance of race and may one day send a message of hope to people now apparently doomed to disappear?

Accordingly the development of the Eugenics international organization must be on a wider basis than the Health office. Such an organization would aim to be sufficiently strong ultimately to make its influence felt in the counsels of the League of Nations and the Pan-American Union.

It would be desirable to establish direct relations with both bodies. National eugenics societies would naturally coöperate with the international center and each other. For the purposes of bibliographical record their publications should be filed with the Union of International Associations at Brussels. In the present condition of financial stringency an elaborate new organization does not readily commend itself to many minds. Moreover the study of eugenics is one which may profitably be allied with corresponding researches, so that the policy may be suggested of working so far as possible in conjunction with other associations.

No doubt, the international committee will continue the useful work which has already been done in formulating plans for international action. The object of this brief paper is to put the matter forward so that the members of the national Societies may be enabled to envisage eugenics in its international aspects. It is true that national variations of conditions often seem to vitiate the value of comparative studies but the interchange of information, the discussion of methods of propaganda, and the nature of popular criticisms can all have useful results. In such work the efficiency of the international center must largely depend upon the loyal coöperation of national organizations, which in their turn, rely upon the support of public opinion to further their work.

The task before the present generation of eugenists is one requiring a large measure of faith. From the circumstances it is inevitable that they will not be able to see the fruit of their labors or even appreciate the bearing of facts collected with scrupulous care. But it may be claimed without fear of contradiction that they have a direct contribution to make towards securing the peace which the leading civilized nations are anxious to obtain for the world. They do not desire pugnacity or bloodthirstiness as prevailing characteristics in the races of the world. The ideal of the eugenists is to gestate a properly balanced being in whom spiritual aims are accorded their value in a frame endowed with physical strength, and mentally equipped to take its part in the service of humanity.

THE WAR FROM THE EUGENIC POINT OF VIEW

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Pessimistic views of David Starr Jordan and Vernon Kellogg challenged. They claim that military conscription delays marriage of most fit young men. But, after serving their terms, these men marry more readily, take healthier wives and have more and healthier children than similar young men in civil population.

They claim that venereal diseases are more prevalent amongst soldiers. But if this were so there would be more cases of sterility and of still-born infants in their families than statistics show.

They claim that war births produce frailer children. But statistics do not bear this out.

During the economic distress of war, ordinarily prohibiting the increase of families, it is the most robust of constitution who are likely to yield to the sexual impulse. Brevity of intercourse between soldiers and their wives reduces possibilities of increase of families, but here again, the chances are greatest in the cases of robust parents. Long separation between soldiers and their wives is beneficial to the vitality of the wives and therefore to their offspring.

Deaths in battle and from wounds are, within limits, adverse influences. But death from disease, both in armies and among civil population, has a favorably selective effect. In the Great War, deaths in combat and from wounds are said to have exceeded in number soldiers' deaths from disease. Therefore, this war probably had a more adverse effect than preceding wars, where disease played a larger part. But in this war, owing to the number of combatants needed, the military selection was less rigorous. Therefore, chances of destruction were better equalized among individuals of relatively greater or less eugenic value.

But of even more importance than physical heredity is intellectual and moral heredity. In practical eugenics, the important thing is not to have a fixed eugenical ideal, which can seldom be realized, but to have adequate criteria for discriminating between favorable and unfavorable eugenic factors. The rule of supply and demand holds true in eugenics as in commerce. Thus, a person of mental genius may be an asset, although disso-

lute in character and weak in body. Thus, the basis of valuation varies with different historical periods and social contingencies, and so in peace and war.

It is doubtful if persons (civil or military) deceased during the war period, would, in any category (professional, artistic, etc.) have achieved more than their contemporaries whom the war has spared. Results of investigation of attainments and promise (based on salaries) of elementary teachers killed in this war indicate that they were not of a social value superior to that of their surviving colleagues.

Excessive mortality may continue for a time, after war, due to persistence of disease and economic distress. Such mortality has a favorably selective influence.

It is compensated for by the excessive birth rate always following war, among the families of soldiers, the most physically fit class.

Children of post-war birth are generally more robust than others, due to long absence of fathers and resulting better condition of mothers (due to enforced abstinence) for reproduction.

Increase of abortions and of premature deliveries, after war, with probable reasons: a bad influence.

Greater frequency of plural births, after war. (Italian and French statistics.)

Revision of current theories, on basis of new data, has been scarcely begun; but preliminary findings, at least, tend to invalidate the pessimistic conclusions heretofore accepted as trustworthy.

Military conscription in Italy seems to effect a favorable influence, rather than otherwise, on the prolificness of those subjected to it.

HOMICULTURE IN ITS RELATIONS TO EUGENICS IN CUBA

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This paper, which I have the honor to present at the kind invitation and request of Dr. C. C. Little, Secretary of the Congress, will be made up of two parts: (a) Relations of Homiculture to Eugenics; (b) Homiculture in Cuba and the work accomplished.

Homiculture as I understand it, and as I have stated before in a paper published in the Bulletin of the Health Department of Cuba, June, 1910, in collaboration with Professor Eusebio Hernandez of Havana, is what our master, Professor A. Pinard, of Paris, has defined under the name of puericulture; that is to say, "The science which has as its object the research and application of knowledge concerning the reproduction, conservation and improvement of the human species." Papers on Homiculture were presented previously in September, 1911, at the Third International Congress for the Protection of Infancy, at Berlin, and in 1912 at the American Public Health Association at Havana.

Professor E. Hernandez and myself have completed this definition of Professor Pinard's by giving a name to that part of the science of breeding where man is concerned. We have, furthermore, marked its boundaries and pointed out what its natural divisions must be, by following the different stages of anthropogeny.

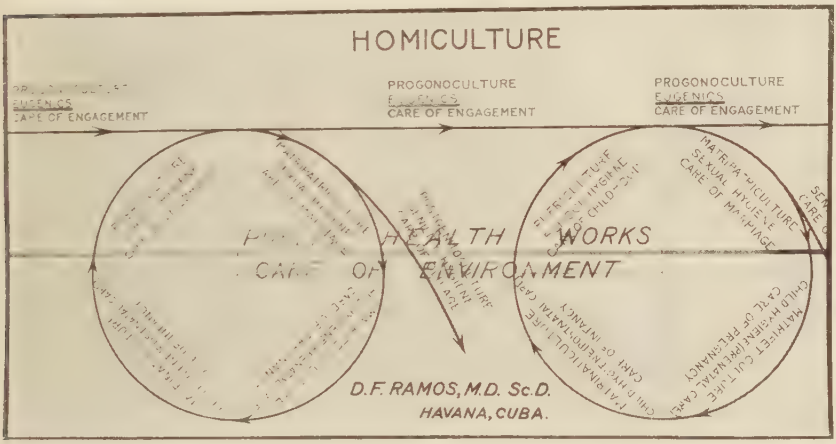
This division of the subject is graphically expressed in the present scheme, in which circles represent the care that must be given to the different phases of the evolution of man in each generation. The upper tangential arrow represents the selection that should exist between the individuals of each generation for the betterment of future generations, that is, in which way the individual must be influenced, bearing in mind the good of the species and not that of the individual. The lower arrow represents the care that the individual must take of himself after he has served the purpose of the species. The red line represents the work done for the betterment of man's environment.

The relations of Homiculture to Eugenics are clearly seen in this chart, as this science is essentially what in the chart is called progonoculture and the

relation that Homiculture has to sexual hygiene, school hygiene and prenatal and post-natal child hygiene, may as clearly be seen.

New terms have been introduced in these definitions with the object in mind of departing from the time-worn words "hygiene" and "hygienic," derived from mythical sources, as it is only from the biological viewpoint and with a biological basis of the consideration of man as an animal that further betterment will be accomplished by the applications of rules that would, slightly modified, hold true for any other living anatomical structure.

When we first published this paper we intended that all this work should be done in a special institution, occupying one building, in which free instruction would have been given to anyone desiring to practice self culture or to devote themselves to the culture of others. This building would have



been called "The Palace of Homiculture" in the same fashion as we have agricultural farms and so forth where the different animal or vegetable species are raised and the science of raising them is taught.

Even if this crowning work has not been put into practice, the Health Department of Cuba has accomplished something, perhaps far more important.

That Department was born through the wisdom and far-sightedness of the American Government, when the brilliancy of the epoch making discovery of the agent of transmission of yellow fever was cast in equal shares upon American and Cuban names. It made possible, by the successful employment of most modern American methods adapted to tropical conditions, a most commendable effort, which culminated in the eradication

of yellow fever and the decrease of most of the infective diseases. The Department undertook immediately the work on sexual hygiene, that of the school hygiene shortly after, and recently child hygiene. In all of these fields it is on the road to success. Much has been accomplished in this direction and it is now that the proper time has arrived to give a thought to Homiculture. It is the proper time to put Eugenics to work jointly with Public Health, as Eugenics has a great importance for such a country as Cuba, where, like here, the increase of population is greatly influenced by immigration. When we shall have a Eugenics Department organized, which I earnestly hope will be a reality in the near future, and when we shall work for the betterment of old age, we shall have completed the programme of Homiculture connecting Public Health and Eugenics. This is what should be done for the scientific betterment of man, making the human species of the future the outcome of a scientific artificial selection and providing the environment in which it is going to live, artificially modified by the efforts of science which will have overcome existing conditions that would have made extremely hard its struggle for life.

THE EUGENICS MOVEMENT IN THE CSZECHOSLOVAK REPUBLIC

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The study of medicine and of public health has for a long time been highly developed in Bohemia. The public health movement, both through the stringency of the laws and through public instruction, through executive organs, and through the doctors and the great number of earnest volunteers and humanitarian societies, has rendered great service, not only to the Cszech nation but also to the nations of western Europe. Here is a splendidly attested example: It was only by reason of the great enterprise of the Cszech doctors, and thanks to the high degree of enlightenment of the Cszech population, that the contagious diseases which inevitably accompany war did not spread over a wide area throughout our land and subsequently continue their march from the East to the West.

For a long time past, in Bohemia, war has been waged against tuberculosis, efforts have been made to restrain drunkenness in so far as this factor demoralizes the individual and generations by rendering them unfit to sustain the struggle for existence. For a long time, in our country, we have tried to control prostitution and to protect from venereal infections, and have exercised supervision over the physical and moral health of children. Popular medical literature in Bohemia is very rich and very much in demand among all classes of the population.

Furthermore, we are, in Bohemia, always in touch with the new, progressive ideas, with humanitarianism and with the new social and scientific ideas, so we were also well prepared for the new eugenic ideas, even before the war.

The first efforts along the line of eugenics, in Bohemia, date, independently of American and English efforts, from the year 1900. In my capacity of neuropathologist, realizing to the full the sad consequences of pathological heredity and of congenital diseases, and believing that all our clinical researches should have a practical purpose from the social point of view, and that through them we should seek to bring relief to suffering humanity everywhere, I have been occupied with eugenic problems since as early as 1896; and I treated this subject for the first time in popular lectures in the

month of January in 1900. As long ago as then, I called attention to the need of a physical examination before marriage. The following year (1901), I proposed, in the Academy of Medicine of Prague, the submission to the Government of a bill seeking the requirement, from prospective husbands and wives, of health certificates.[1]

In 1902, in the article "Public Health Efforts and the Question of the Marriage Contract" (Lidove rozpravy bekatiske, Praha, 1902), I made public the motives which had led me to make this proposition to the Academy of Medicine; and I referred again to these arguments on the occasion of the International Congress at Lisbon, in 1906 (Congress of Lisbon, Neurology and Psychiatry, page 600: "The Marriage Contract and Public Health"). I summarize these arguments:

The public health movement of our day is concerned almost solely with the physical health of the man, and deals especially with our contemporaries. But man does not fall sick solely from external influences. There are thousands of people who become incapable of sustaining the life struggle because they have come into the world sick and weak as a result of the infirmities of their parents; or who are born with such frail constitutions that the least shock—trifling to a healthy person—renders them ill. The laws of pathological heredity and of the heredity of the morbid disposition, as well as of infantile diseases proceeding from poisoning or infection through the parents, should command the immediate attention of hygienists.

The public health movement, in seeking to preserve the individual from disease and in so controlling some of the causes which tend to affect the health of posterity, also protects posterity in a certain measure. But this is not all the preventive action of which we are capable. We must go down to the root of the evil. If, in founding the family, consideration is given to the consequences of pathological heredity and to congenital maladies, one may absolutely affirm the diminution of the number of feeble-minded persons, of syphilitics, of tubercular persons, of criminals, and of children afflicted with nervous diseases or otherwise degenerate.

I will not cite the laws or examples of pathological heredity as it entails nervous and mental diseases, syphilis, tuberculosis and the different diseases of malnutrition; the dreadful consequences of alcoholism and of other intoxications in the parents; or the sad consequences for the children of blenorrhagic contagion in the parents. Who could remain unaffected at the sight of the poor, infirm human creature, wasted, unfit for the life struggle, exposed to the ridicule of its neighbors and to the custody of society—and all through the fault of its parents? Have not these wretched beings the right to claim pity and protection? The consequences of pathological heredity and of morbid parental influences in general, manifest themselves not alone in absolute physical or psychological

[1] During the course of a discussion of the subject in question, I learned that a conference was held at the Prague City Hall, at the suggestion of the philanthropist, Ferdinand Naprstek (?), bearing on the prohibition of marriage between tubercular persons.

At the Third Congress of Cszech Physicians and Scientists, held in 1901, Dr. Navrat proposed the preparation of a resolution to be sent to the legislative body providing that epileptics should not be permitted to marry save with a physician's consent.

incapacity for the life struggle, but also in partial incapacity. We must consider the host of eccentric children, of lazy, or nervous children—in short, of degenerate children. In the degenerate child is very often found the seed of crime. I believe that it is the duty of the science of public health to seek the means of protecting the world from these evils, in so far as possible. I consider it an established fact that the union of two individuals proceeding from families in which any of the above-named diseases has become a family attribute and has appeared, either in its complete development or in different modifications, in several generations and even in the most distant relatives—such a union produces diseased offspring. It is from this enfeebling of the race that ignorant society must be defended.

But it is not merely a question in marriage of protecting the children to come; it is also to protect the wife from the husband, from syphilitic and gonorrheal infection, and from the unfortunate consequences of a drunken husband. Anyone who knows the tortures of the good woman who, at first, blooming, strong and full of health, withers after contagion, is deprived of the joy of life and of children, and is plunged into grief and shame, will have no hesitation in declaring that the transmission of an infection of such sort is a greater crime than murder.

If we cannot eliminate all the evil, all the misery and grief which may be caused by marriages among persons so diseased, we ought at least to try to organize the fight against this evil. The simple instruction of the public is by no means sufficient. There is always to be found a large number of men who, for pecuniary advantage, will sacrifice the health of innocent women and of future generations. It is necessary to protect, in so far as possible, the woman, or the man, against the transmission of syphilis, of gonorrhea, of pulmonary tuberculosis, and against the effects of alcoholism. It is necessary, likewise, to protect posterity from dangerous hereditary diseases, such as syphilis and tuberculosis, in so far as possible. In order to even partly attain this end, it would be necessary to require that everyone consult a physician before marriage. This consultation might remain absolutely secret. The certificate issued by the physician would simply indicate that there was no obstacle[2] prohibiting marriage.

This proposition contains no new principle, but it is shaped to conform with our laws of today as they are influenced by the new medical and biological knowledge which was unknown during the epoch which saw the birth of our present-day civil laws.

There are, to be sure, certain inconveniences, but the advantages of the proposed law are so great and imperative, in these days, that reflection is not necessary for their recommendation, it is to be remarked that even our existing marriage laws presuppose a physical examination before marriage.

Paragraph 48 of our civil code provides: 'Mad and feeble-minded persons, idiots and minors may not legally enter into the marriage contract.'

Paragraph 53 provides: " . . . . a contagious disease or a defect constituting an obstacle to marriage is legal ground for refusing authority."

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[2] Mental maladies, including general paralysis, contagious forms of syphilis and of gonorrhea, chronic alcoholism and infectious tuberculosis. Naturally, individual exceptions might be made. The law itself should be drafted by an international commission with the assistance of consulting jurists and sociologists. The medical certificate would then be required with the other documents with which the affianced parties would present themselves to the authorities before marriage.

But so far the physician has never intervened before marriage. Moreover, mad and feeble-minded persons and idiots do not represent the only dangerous mental diseases. A person of tranquil aspect, although not to be so recognized by a lay observer, may be a dangerous paranoic. A neurasthenic, slightly depressed or giving the impression of an innocent gaiety, may be a dangerous general paralytic. Will not the one or the other party be grateful for a timely warning? Finally, who is the proper and competent officer to advise the authorities of the existence of a contagious disease or of a defect constituting an obstacle to marriage? Who is the proper officer to give this timely protection to one of two persons concerned? Even our existing laws, then, would seem to exact the enforcement of the above-described proposition.

The foregoing is the content of my article of 1902.

In the same year (1902) in which this article appeared, I requested the Society of Neurology of Paris to create an international committee to be composed of physicians, consulting jurists and sociologists, to organize the fight against human degeneration due to pathological heredity—a committee which should undertake the preparation of drafts of laws prohibiting marriages from which only seriously diseased offspring, incapable of sustaining the struggle for existence, could proceed. The Society did not wish to take the initiative in this matter.[3]

I set forth the necessity and the value of the eugenics movement in Bohemia not only from the physical point of view, but in a higher sense, from the point of view especially of moral, national and human welfare. I was and I am convinced that through well conducted and developed eugenic efforts, we may strengthen and increase in power the life of our nation, both internally and externally. Furthermore, the very complex problems which face the eugenicists and which have so important a bearing on family, social and economic life, and all the juridical and pedagogical points of eugenics which I have mentioned at some length in the article cited, are familiar to me. Eugenics is concerned with the health, not only of the individual, but of the entire nation. A healthy nation, as healthy as possible from the psychical and moral point of view, and with well developed altruistic sentiments, holds in check perverse and anti-social instincts and works for the fraternity of the nations, for peace and for true liberty. Even of this high importance do I consider eugenic efforts, and I am certain that eugenic progress among the civilized peoples of the world can alone prepare for the future the way to a permanent society of the nations.

[3] I made the same proposal to the Society of Psychiatry and of Neuropathology of Moscow, with no better success.

On the occasion of the discussion of this subject in the Neurological Society, attention was directed to the book by Cazalis, which I proceeded to procure for myself at once, and which I again cite at the end of my article. Cazalis is guided by almost the same ideas and reaches the same conclusions.

That is why my efforts have been unceasing. Both in magazine articles and by word of mouth in my popular university lectures I have been trying to spread eugenic ideas in Bohemia. I have not been alone. In Cszech literature has appeared the translation of Haycroft's book ("Darwinism and Race Progress") by G. Zdarsky, and Dr. Walker has published in the "Popular Medical Library" an excellent article dealing with marriage.

In 1908, there was founded in Bohemia a Cszech infants' protective commission which has succeeded in developing all our eugenic ideas. Through it we have obtained some good results. A great humanitarian movement, the foundation of an asylum for unfortunate children, a bureau dispensing free eugenic and medico-social advice—that is what the commission accomplished at the beginning of its career. At the time, the eminent Dr. Brozek acquainted the Cszech people with the eugenic efforts of the Americans and the English, in his article "Eugenika" (1912). At the same time, Dr. Herfort devoted himself to eugenic research in the asylum for idiot children, at Ernestinum, and worked in collaboration with Dr. Brozek. They brought about the foundation in Bohemia of the first central eugenics bureau. There followed the founding of the pedagogical institute and the bureau of psychotechnical information.

In 1914, I founded, with my eminent colleague and distinguished professor of biology, Vladislav Ruzicka,[4] a supplement, in my *Review of Neurology*, dealing with Heredity and Eugenics, which, through the original articles of Professor Ruzicka of the biological institute and through analyses of all the modern literature, seeks to inform its readers of the eugenic movement in all countries.

In 1915, we founded, through the assistance of the above-mentioned Infants' Protective Commission of Bohemia, a Cszech Eugenics Society of Prague.[5]

In the year 1915 began systematic work in Bohemia. Professor Ruzicka's Biological Institute became a center of earnest theoretical work. The Eugenics Society, in so far as was possible during the war, continued to propagate eugenic ideas among the people, and there was at hand a number of devoted collaborators both at the Biological Institute and in the Society itself. In the first place should be mentioned the young and eminent

[4] From the pen of this author have appeared "Human Heredity in Health and in Disease," in the Popular Medical Series, and other very important works.

[5] We should hand down to posterity the fact that the legacy of an intelligent lady (W. M.), deceased in 1914, contributed greatly to the foundation of the Society. This woman, having been infected with syphilis by her old husband, demanded, in her will, in urgent and persuasive language, the propagation of eugenic ideas and the foundation of a eugenics society.

Dr. Krizewecky,[6] who, by his valuable work has contributed largely to the knowledge of eugenics in the Cszechoslovak Republic.

We have defined the aim of the Society in these terms: (1) *the special study of biology;* (2) *the dissemination of knowledge of the conditions of physical and psychic health among all classes of the population, together with the conviction of responsibility toward future generations*; (3) *the fight against hereditary diseases and those of early infancy;* (4) *the encouragement of care for women in confinement, of the new-born, and of nursing women;* (5) *the battle against alcoholism and tuberculosis, against venereal diseases and against all the other factors which destroy the roots of the nation.* The Society pursues this aim by means of popular lectures and publications, and it has tried to circulate its propaganda from the elementary school on. It is fostering the idea of creating at Prague a hygienic museum as a center of hygienic study and education for the people, and it has persistently developed the idea of founding a ministry of public hygiene. This ministry having been established in 1917, still under the Austrian régime, the Society hastened to address to it a resolution covering the whole matter of eugenics, and when we again secured our liberty the Society submitted the same resolution to the Cszechoslovak Government. This resolution requested (1) the creation of the national institute of eugenic research, (2) the adoption of records for registering the health of the population, (3) the foundation of central eugenics stations, (4) an institute for the study of man's psychological development, (5) a national institute of psychology, (6) a museum of comparative genetics, (7) the protection of the infant from its nurses and its mother, (8) the reformation of the profession of the mid-wife, (9) the reorganization, in all the schools, of training in the teaching of modern hygiene, especially in so far as it concerned the sexual life, (10) aid in the eugenic education of the people in general by means of publishing discussions, theatrical and cinematograph performances, and particularly by means of a hygiene museum as the center of the popular health instruction, (11) finally, it requested the requirement of a certificate of health before marriage.

The Society has conducted an investigation which has cleared up several questions of eugenics. Some of these subjects are: "Actuality and Significance of Eugenics Problems," (Dr. Kulhavy); "Philosophy and Ethics of Eugenics," (Prof. Fousska); "The State of Health and the Quality of the Nation," (Dr. Prochazka); "Physiological Conditions of the Well-being of the Nation," (Prof. Babak); "The Problem of the Population," (Professor Drachovsky); "Prevention of Infant Criminality," (Professor Haskovec);

[6] This author has also published a work treating "Consanguine Marriages and Their Effects," which appeared in the "Eugenics Library" series founded by the Society.

"The Influence of Industry on the Quality of the People," (Prof. Prochazka) "The Influence of Social Agents on the Quality of the People," (Madracek, deputy); "Venereal Diseases and Their Effect on the Quality of the People and of Posterity," (Prof. Janavsky and Prof. Samberger); "Concerning Supplementary Instruction for Idiot Children and in Asylums for Unfortunate Children," (Dr. Batek); "Imbeciles and Unfortunate Children from the Juridicial Point of View," (Dr. Tuma); "Public and Private Eugenics Instruction in Moravia," (Dr. Mezl); "Alcoholism and its Effects," (Dr. Novy); "Reform of the Marriage Law from the Eugenic Point of View," (Prof. Haskovec); "Safety and the Eugenics Movement," (Dr. Lukas); "Questions of Social Safety," (Jos. Klecak); "The Right of the Child and the Faults of the Laws of Social Protection," (Dr. Pokorny); "The Battle against Tuberculosis," (Dr. Merhaut); "The Organization of Public Welfare Work in Bohemia," (Dr. Welz); "The Organization of Aid for Nursing Women and Mothers," (Dr. Batek); "The Organization of the Eugenic Movement in Bohemia," (Prof. Haskovec).

The Society has contributed to the founding of the Cszech Society against Venereal Diseases, and is making every effort toward the creation of a society for a hygienic museum of Prague. We pursued all these large aims before the war. They are still more urgent today, when all the civilized nations have lost so heavily in men on the field of battle, and when the dreadful consequences of the great war threaten future generations.

All these desiderata are now, under the Republic, receiving attention and the earnest efforts of our young Ministry of Public Health, as well as of our Red Cross. In the Ministry of Public Health have been elaborated laws working against venereal diseases, and efforts are being made to reorganize the teaching of hygiene in the schools; a law is being prepared governing the physical education of the people and projecting a high school of physical education at Tyrs. The Red Cross is making every effort to organize toward a common purpose all the sanitary and humanitarian societies of the Republic, which are very numerous.

I can with pleasure affirm the favorable welcome and the effective support which the diffusion of eugenics ideas has met with among the Cszech people. It is especially with the big gymnastic society of the Sokols, the largest association of Cszech women, presided over by Deputy Madame Purkyne, with the high school students, the workingmen's societies and the military authorities that eugenic ideas have found the heartiest welcome.

In 1919, the Government proposed to the National Assembly a law of which the first section provided: "Only those may be married who present a certificate signed by a public physician (communal, cantonal, departmental

or policial) that they suffer from no disease which may defeat the purpose of marriage or which may invisibly have an adverse effect on the health of the second party to the marriage or of posterity."

This proposition, made by Deputy Dr. Rollicek, was favorably received in the socialistic and agrarian press. Unfortunately, the bill did not receive the same welcome among certain physicians, particularly in the higher council of public hygiene and in the Ministry of Public Health. This delayed its adoption.

I am convinced, however, that similar provisions will be incorporated in some form, according to the customs and the culture of the countries, as in America, in the codes of all the modern states: this incorporation is demanded by the medical progress made during the last century, and by our present-day post-war need.

EUGENICS AND ISLÂM

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One of the spectacular episodes of human history is the political rise and decline of Islâm. Starting with a few families of Arabs in one of the most sterile regions of Arabia, in a couple of centuries it had conquered a large part of Asia and Africa, and had seriously threatened Europe, retaining a firm grip on Spain for centuries after it had been thrown back from France at the battle of Tours.

While Islâm is primarily a religion, it is needless to point out that so successful a movement must have been based on something more than a theological system. As a fact, Islâm is among other things a system of politics, economics, education, and eugenics.

The purpose of this paper is to outline some of the features of Islâm which seem to be eugenic, or the reverse.

It is difficult to make broad general statements in this field, because Islâm has embraced so many peoples, and has been so much modified in one part or another by their own traditions and customs. I shall speak principally of the Arabs of the first few centuries after Muhammad, as being the most legitimate exponents of Islâm.

A. SELECTIVE AGENCIES

In the first place, one may note certain valuable selective agencies, which I shall enumerate without particular regard to the order of their importance.

1. Consanguineous marriage

This is a feature of Arab life much older than Islâm, but like many other traditions and customs is deemed by the Arabs to have received the sanction of Muhammad. It is well known that among the desert Arabs in particular, a young man had what might be termed "the refusal" of any female cousin. As a general rule, the latter was not betrothed by her parents, until her own male cousins had the opportunity to take her in marriage; and it was quite the custom for cousins to marry.

This led to the establishment of the phrase "daughter of ———— my uncle" as an accepted euphemism for "my wife," since delicacy forbade

a man to speak too directly, in public, of such a personal matter as his harîm.

It is not necessary to point out the eugenic effect of consanguineous marriage, in the light of researches of the last half century. In a country where existence was as severe as in desert Arabia, it may be fairly assumed that many of the weaklings were weeded out early in life, and the relatively strong, physically and mentally, left to reach adult life and accompany the tribe on its wanderings. In such a stringently selected people, the practice of cousin marriage could not fail to be useful, by intensifying the desirable traits of the tribal germ-plasm.

2. Sanctity of marriage and parenthood

Islâm has always taken the family relation seriously, even though it placed women in a position that to most western eyes seems intolerable. Marriage has been regarded from the eugenic point of view, as a duty to society rather than merely an individual affair. Much of the Muslim teaching on this (as on every other conceivable point) is contained in the collections of thousands of traditions—many of them doubtless spurious—or sayings of Muhammad. While the Prophet did not absolutely prohibit celibacy, it is looked on as an inferior mode of life. On one occasion he asked a man if he was married, and being answered in the negative inquired, "Art thou sound and healthy?" Upon the man replying that he was, Muhammad said, "Then thou art one of the brothers of the devil." It is related[1] that one of his companions, 'Uthmân b. Mathûn, wished to lead a celibate life, but the Prophet forbade him, saying "When a Muslim marries, he perfects his religion." Again he enjoined, "Marry women who will love their husbands and be very prolific, for I wish you to be more numerous than any other people."[2]

Even to this day, to abstain from marriage, when there is no real impediment, is esteemed not only improper, but rather disreputable.

3. Polygamy

On this complicated subject I can do no more than touch, since data do not exist for anything more than a hypothetical treatment of the eugenic aspects.

While polygamy is sanctioned for all Muslims, it is confined principally to two classes: the rich, who can afford to maintain more than one wife in idleness; and the poor, among whom the women work and support themselves.

[1] Mishqat al-Masâbîh, Bk. 12, Ch. 20.
[2] Ibid., Bk. 13, Ch. 1 et seq.

Hypothetically, it might be supposed that in the early days when polygamy was confined to the wealthy and influential classes, and they married their equals, it would have certain advantages in increasing the birth-rate from that section of the population.

On the other hand, when polygamy came to mean principally the maintenance of slave women as concubines, in powerful families, it became the reverse of eugenic.

4. Sound ideas of heredity

No nation, perhaps, has had a more accurate realization than the Arabs, of the importance of inherent traits. It is not surprising that they were successful horse breeders. Such sentiments as that ascribed by a poet[3] to Alî b. Abî Tâlib, the cousin-germain, adopted son, and son-in-law of Muhammad, are extremely rare:

> My soul is my father, my title my worth;
> A Persian or Arab, there's little between:
> Give me him for a comrade, whatever his birth,
> Who shows what *he is*—not what others *have been*.

The literature is full of proverbs and stories illustrating the importance of heredity. In Omân, a proverb says, "If you desire to have a son, select for him a grandfather and an uncle on the mother's side—though the mother herself may be a hateful one among women." The persistence of sex-limited traits is here recognized!

It is a widespread idea among the Arabs that virtues are inherited through the mother rather than the father; and that a man commonly resembles in character his maternal uncle. Says another proverb, "The boy if he turns out poorly, belongs two-thirds to his mother's brother"—that is, two-thirds of his traits are like his uncle's. Another commands, "Take girls from the breasts of their father's sisters;" that is, in choosing a bride, judge of her by her father's sisters, whom she will resemble just as a boy resembles his mother's brothers.

Much attention was paid to lineage and family connection, in choosing a bride for the son of the house; and the well-known emphasis which the Arabs have always laid on genealogy fitted in well with this.

The resistance of original nature to ordinary nurtural changes—a doctrine still offensive to many civilized people—is frequently and aptly illustrated in the literature of Islâm. Here is an example:[4]

[3] Faqîr Jam'i Muhammad As'ad in the Akhlâq-i-Jalâlî, translated by W. F. Thompson.
[4] Nafhat al-Yaman, 111.

A certain king asked his minister, "Does education overcome nature or nature overcome education?" He answered, "Nature is the stronger because it is a root, while education is a branch, and all branches revert to their root." Thereupon the king called for wine, and sent for a number of cats, which presented themselves with candles in their hands, and stood around him. So he said to the minister, "Behold thy error in thinking nature is the stronger." The minister replied, "Give me the respite of this night." He said, "I have done so." So when the next night came, the minister took a mouse in his sleeve, and having tied a string to its foot, he went before the king. When the cats advanced with candles in their hands, he let loose the mouse from his sleeve and the cats, seeing it, threw down their candles and chased the mouse, and the house was nearly burnt down. The minister exclaimed, "See, O king, how nature overcame training and the branch returned to its root." He said, "Thou art right: excellent is thy understanding."

One of the Persian poets[5] has given a horticultural illustration:

Take, of some bitter tree, a shoot—
In Eden's garden plant the root;
Let Waters from the Eternal Spring
Amidst the boughs their incense fling:
Though bathed and showered with honey-dew,
Its native baseness springs to view;—
After long care and anxious skill,
The fruit it bears is bitter still.

A people with ideas like these had at least a good foundation for eugenics.[6]

5. Endowment of superior families

The Galtonian idea of endowing superior families of the population has perhaps been attempted more energetically in Islâm than anywhere else. There are two classes of funds available: the waqf, or bequest legally inalienable; and the sadaqah or casual contribution. The administration of these funds is either in the hands of the religious leaders, ex officio, or in an official department created for that purpose by the Turkish, Egyptian, or other government involved.

In religious centers like Mecca and Medina, most of the "better classes" of the population derive an income from these endowments of the pious. In other Muslim countries, the funds usually go to the religious and learned professions. The Sacred Cities formerly had immense waqf holdings in all parts of the Muslim world, but during the last century the cupidity of various rulers has absorbed many of them.

While the system has been subject to many abuses, and may not have been administered eugenically, it seems to correspond in principle with what has

[5] Abû-l Qâsim Mansûr, called Firdausi, in a satire on Mahmûd of Gusni.
[6] This science in Arabic is called 'Ilm tahsîn al-nasl.

often been considered an important part of the eugenics program. It is, I must add, largely a development of later centuries, rather than a fundamental part of primitive Islâm.

6. Divorce

Easy divorce, at the will of the husband, is one of the scandals of Islâm; but in so far as divorce, or the taking of a second wife, is practiced in case of childlessness of the first wife, it may be thought to have some eugenic value in obviating unfruitful marriages.

B. CONTRA-SELECTIVE AGENCIES

1. War

Islâm being inherently a militant organization, its first few centuries in particular were full of bloodshed. It can hardly be doubted that the slaughter of men from the best families of Arabia had a serious dysgenic result.

2. Concubinage

The doctrines of Islâm are generally interpreted to permit any man to have four contemporaneous wives and an unlimited number of concubines. The personal example of Muhammad in this connection was liberal to say the least, his wives being eleven and his concubines two in number. Concubinage has been a widespread practice among the wealthier classes. The introduction of African slave-girls resulted in the infusion of much Negro blood into Arabia. I believe the dysgenic results of this have not been sufficiently realized.

3. Indiscriminate charity

While the waqf philanthropies and some other tributes have largely served to maintain the religious and learned professions, their value has in part been counteracted by the indiscriminate charity preached and practiced in Islâm. It can not be doubted that this has allowed many bad stocks to perpetuate themselves under urban conditions.

4. Pilgrimage

The visit to Mecca is incumbent on every adult male at some time during his life, unless such an impediment exists as bad health or lack of means. While only a small fraction of the Muslims of any generation actually make this pilgrimage, it seems reasonable to suppose that it has drawn the better classes in proportionately larger numbers, and subjected them to death by pestilence, violence or the hardship of travel, and to the disruption of home ties. If so, its effect must be dysgenic.

C. SUMMARY

While quantitative data do not exist to prove any of the suggestions made above, I believe it must be recognized that Islâm possesses certain eugenic elements to an unusual degree. The most important of these are perhaps the respect of marriage, a sound idea of heredity, and the practice to an unusual extent of cousin marriages.

On the other hand, the bellicose nature of the creed, and the widespread introduction of inferior blood through concubinage, have been powerful factors in its decay.

With these biological factors, one must also take into account religious, political, economic, and other influences, in any study of the Muhammadan state.

THE SIGNIFICANCE OF CAUSAL RESEARCH IN EUGENICS

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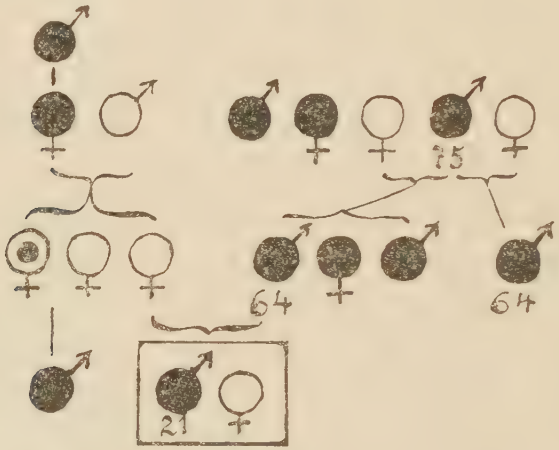
It does not suffice only to draw attention to the Mendelian explanation of human pedigrees, it is imperative to point out also the most principal difficulties which must be borne in mind, especially so when we have to read pedigrees of a pathological character. There will not always be pedigrees suitable for the demonstration of these difficulties. The appended pedigree of apoplexy planned at Slavkov in Moravia (C. S.) is a very graphic illustration of the indicated difficulties, the overcoming of which is possible, in my opinion, only through the institution of causal research, the eugenical meaning of which is thus brought in proper light. The pedigree, for understanding which, all necessary is contained in the subjoined test, if superficially criticized from the Mendelian standpoint, directly conduces to the conclusion that the point is a homozygous character of the factor for apoplexy, many sides of the pedigree being thus explained. A physician, however, will realize numerous doubts. Apoplexy is due to the destruction of cerebral tissue by hemorrhage from a burst artery. The reasons of this fatality can be various. The blood pressure can be increased by the most different causes to a degree which cannot be resisted by the walls of the arteries. An abscess or inflammation can impair the artery. An embolus from another organ can pass into circulation, obstruct the artery and bring about hemorrhage. The embolus again can be due to a great many reasons. It can consist of microbes, shreds of tumors, tissues (and in fractures of tubular bones), fat, fragments of heart lobes affected again by different diseases. Finally, the blood-vessel walls can be interfered with, due to most differing causes, such as imperfect development due to atypical evolution or pathogenic processes, or arteriosclerosis, or degenerative processes due to various causes, or the influence of bacterial toxins following infections, or intestinal poisoning and others. And all these different causes can besides occur in mutual combinations. If these uncertainties are not quite settled, if the identity of the cause in all cases had not been established, it is impossible to make Mendelian conclusions from a pedigree. The question is, therefore, so important that the continuity and identity of diagnosis shall replace the proof of a pure line which is indispensable if pedigrees are to be judged

by application of Mendelism. Further, it must be established beyond doubt if in individual cases the disposition to disease has not been acquired already in individual life, even its intrauterine period. Such acquisition of disease is possible. The symptomatology coincides with that marking disease rising from inherited disposition. There the physician faces a very difficult task of discriminating an acquired disease from an inherited one, a task of which with the present stage of science, he will be able but rarely to acquit himself with success, and which will require all his intellect and profound medical knowledge.



A Pedigree with Repeating Cases of Apoplexy

Black circles indicate apoplectical persons; figures below some give ages at which concerned persons have been afflicted. The rectangle enclosing the last two circles denotes twins. The circle with a bull's eye in its centre stands for a female who died somewhere and about whom, however, it has not been established that she died of apoplexy.

Thus it is quite clear that we must not be contented with a mere application of Mendelian methods in the solution of pedigrees but must study causally every individual case if desirable results are to be arrived at, and a real benefit derived from eugenics.

If we consider that the results of the study of pedigrees are to be exploited in hygienics and sociology as well as in eugenics and legislation, we are bound to realize the immense responsibility for our conclusions. Again, it is clear that the study of pedigrees for eugenical purposes requires a man of expert medical knowledge and especially that any lay collaboration must

be refused in the interest of the matter itself. Why, to return to our subject, a layman might see apoplexy also in a deep swoon in which the sufferer would die, though the swoon was due to cerebral anemia, i.e., a process opposite to apoplexy.

Finally, it is clear what service would be rendered to eugenical research by Personal Health Registers if they were kept by state physicians versed in the doctrine of heredity and genetics. The duty of these physicians would in the first place be to furnish the safest possible evidence for every entry.

A MOTION FOR THE ORGANIZATION OF EUGENICAL RESEARCH

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In the post-war days the necessity of eugenical research made itself felt very appreciably. As the world is undergoing a regeneration and everything is being organized or reorganized, it is imperative to improve also the organization of Eugenics. This demand is especially justifiable as eugenical research is not only concerned about the evils caused by the War, but also about the questions connected in general with the substance of national and racial being. It is a moral duty of every nation to insure as best possible the fullest liberty and progress amidst the rest of humanity.

This can be best attained by ensuring the evolutional conditions which might enable a nation to reach the utmost development of its spiritual and physical abilities, and follow its own road to the highest goals of mankind. This, of course, means to employ all possible means leading to a socially-biological improvement in the quality of a nation. In the first place, there are means which affect the very roots of a national being, i.e., the reproduction of individuals composing a nation, means that are offered to us by the genetical research which has experienced so wide a development. Eugenics having recourse to these means become *national eugenics* in the most literal sense of that word. Their aim it is to maintain and develop the biological individuality of a nation and prevent the decline of its biological organization in whatever respect.

The individuality of a nation and its socially-biological efficiency rests in the harmony between its hereditary constitution and the influence of its external conditions. These two factors control its qualities which are determined and maintained by them. It is a still distant aim of eugenics to get acquainted with their action so as to understand the origin of all characters marking the individuals of a nation. If we find the causes of their origin it will be easy for us to control their development, and influence the same according to the requirements prompted by the object of eugenics, i.e., the improvement of the social-biological efficiency of a nation.

Consequently, the discovery of heredity factors, and external conditions for their development, is an indispensable presumption of any eugenical activities.

Although much information has been compiled to arrive at an understanding in the indicated direction, still the greater part of this information cannot be utilized for the purpose of eugenics. The eugenical research must accumulate and exploit such information in a special manner. It is of no avail to know what spiritual and physical qualities mark the different tribes of a nation. We must know which of them are hereditary and which are not. Which are transmitted by men and which by women. In what manner the individual qualities react in cross-breeding with the individuals of the same or of another tribe. What changes ensue, if the individuals of one tribe emigrate to the regions of another tribe. This applies to the normal and to the morbid qualities.

There is almost no such genetical analysis, and thus we are doomed to an eugenical idleness, or to a mere imitation of foreign examples, more or less good and suitable. This deficiency can be remedied by the establishment of an Institute for National Eugenics.

I conceive this institute as an institution for research. Its program would be to try to find by an heredo-ecological analysis of folkloristic, ethnological and other experience, the genetical character (the hereditary value, dependence from external conditions) of the physical and spiritual qualities of the individual tribes of a nation, or of foreign nations settled in its territory. By furnishing statistical returns of a population, its health, genius, talents, inferior elements, genealogies of physical, spiritual, normal and pathological types, and by investigating their geographical distribution, this institution would prepare material which in the eugenical practice of future days might furnish a base for eugenical progress.

The work of this Institution would require to be divided among several departments, to wit:

1. The Institution for the Research into Heredity in Man in General, the necessity of which it is unnecessary to emphasize, owing to its biological and eugenical significance. A special Institution is required for the problems of heredity in man, as their investigation will demand a complex apparatus which cannot be managed by workers from other institutes. The investigations, besides, must be conducted on lines different from those adopted in the research into the heredity in animals and plants.

The material required for the laboratory work would be furnished by a network of *Eugenical Offices* resembling those already in existence in the United States and some European localities (at Prague at the "Ernestinum" an asylum for the feebleminded under the management of Docent Dr. K. Herfort) partly attached to the institutions for social relief, and by *Personal Health Registers* in general, the institution which I consider to be an indispensable eugenical requirement.

2. The Institution for the Ecological Research into the Development (evolution) of Man is also as indispensable as the preceding one, since every character is a result of the influences of internal and external agents while both are of exactly the same importance. The study of the influence of internal factors on the development of man falls within the scope of the Institution for the Research into Heredity, while the study of the influence of external factors would be a task of the Institution for the ecological research into development (evolution). As in the study of heredity also, here it would be necessary to adopt methods different from the methods of the mechanics of development of other organisms. Besides experiments, also statistical methods would have to be adopted, especially so in researches into the influence of social influxes and evils, such as in industrial work (both in mill and household), alcoholism, diseases in general and sexual diseases in particular.

It goes without saying, that the suggested research would not be concerned only about the physical characters. It would be necessary to organize also the study of psychical dispositions and their development by setting up, say,

3. The Institution for National Psychology where all psychical dispositions of both the individual national tribes and the individual families (strains) would be subjected to investigation from a descriptive and a causal point of view, and particularly from an ecological standpoint (geopsychical phenomena). This study would also pay due attention to the study of the causes and conditions of psychical evolution in general, with view to the determining influences.

The Institution for National Eugenics should not, of course, work in one direction only, but would have to admit to work a biologist as well as a psychologist or a physician, teacher, artist, philologist or historian. The utilization of knowledge, gained through its operation, in eugenical practice will be possible only in distant future. Yet, this very circumstance ought to stimulate us to act about collecting materials. If it will not be immediately possible to utilize such material for eugenical purposes, it will facilitate the *self-cognizance* of a nation, which is the supposition of its *self determination.*

This Institution ought to be combined with a Museum for Comparative Genetics, illustrating both the ontogenetical development and the phylogenetical evolution, the doctrine of heredity and accommodation, and and eventually, also, the results of mechanics of development. Thus the Museum would be a source of instruction for the masses at large, and an inexhaustible fountain of scientific research.

As there are many eugenical institutes that are of a private character, which circumstance is detrimental to their authority and reduces their responsibility, I point out that in my opinion *it is a duty of every civilized state* to set up such institutions. This duty devolves from the benefit derivable by a state from the operations of such institutes. *I should deem it proper if the Congress reminded every civilized state of this duty.* The details of the management of such institutes would be left to every individual state, as they, no doubt, would differ with the varying requirements of every country.

If this proposal should be realized—and I believe that its tendency and object is in line with present day efforts—we could say that in this manner a scientific foundation had been secured for the existence of every nation, a scientific security for future generations from an eugenical point of view, as the results of the suggested Institutions would render it possible to pursue the policy of population as well as the biologically educational and the social-biological policies on scientific lines.

DISCUSSIONS OF PAPERS READ AT THE CONGRESS

HARMONIC AND DISHARMONIC MATINGS OR CROSSINGS (NORDIC RACE TYPES AND HYBRIDS WITH LAPS)

JON ALFRED MJØEN

HENRY FAIRFIELD OSBORN: I wish to express officially the thanks of the Congress to Dr. Mjøen first for coming to the Congress and second for presenting this splendid contribution to the subject. I do not wish to exaggerate but I think that Norway is taking the lead in eugenics of all other countries and we wish to congratulate Dr. Mjøen on his success in obtaining the facts and to wish him all success in continuing the work of the Winderen Laboratorium.

RACE AMALGAMATION IN HAWAII

FREDERICK L. HOFFMAN

and

SOME RESULTS OF RACE MIXTURE IN HAWAII

LESLIE C. DUNN

CLARK WISSLER (chairman): We have had two very interesting papers by two of the speakers on the same field. Dr. Sullivan, who is connected with this Museum will tell of his work in the Islands.

LOUIS N. SULLIVAN: I have been in the Islands for the past eighteen months, and have been collecting material most of that time. The only thing I must add is respecting some of the statements made by Dr. Dunn in regard to head size. He has made use of the cephalic index of Hawaiian or Oriental groups. Dr. Dunn has dealt largely with the first generation hybrids, though intermarriage has been going on for almost a century, and the Chinese are in the fifth to sixth generation of the stock. We cannot experiment with man. The Hawaiian white man marries a Hawaiian woman, the Hawaiian white woman marries a Hawaiian or Chinese. We have one race throughout; in this case of course it must be that the Hawaiian is gradually absorbed by the Chinese, white and Portuguese. The value of this hybrid stock varies with the individual. The Hawaiian-Chinese is regarded as worth while. The Hawaiian-whites are looked upon as the negroes are in this country. The vital statistics show that the part-Hawaiian is an improvement on the Hawaiian stock although the birth rate is considerably less. I think it is fair to say that at the present time the part-Hawaiian is biologically a better individual than the full Hawaiian,—more capable of coping with modern conditions of life and civilization.

INTERMARRIAGE BETWEEN JEWS AND CHRISTIANS

MAURICE FISHBERG

QUESTION: I would like to ask the speaker if the eminent persons of partly Jewish descent he mentioned were of stock similar to the Polish Jew that is coming to this country or were they of eminent people in the country in which they lived?

DR. FISHBERG: Scotch any Jew and you get a Polish Jew. For the last seventy-five to one hundred years there has been a great immigration from the east to the west, and the Polish Jew came originally from the east. Mostly all of the German Jews are of Polish origin.

DR. DAVENPORT: Dr. Fishberg's paper was very interesting, in its statistics and also the list of learned Jews. Is it not true that these were mostly halfbreeds, that is, they were descendants of Jews and non-Jews?

DR. FISHBERG: As such I read them.

DR. DAVENPORT: The statistics of the psychological examinations of the army men do not justify the hope that we were receiving from Europe the best of her Jewish population, because these statistics indicate that the largest proportion of the lowest grade persons measured in the psychological tests were from Poland, and I presume that it is fair to say that a large proportion of the Polish immigrants come from the Jewish race. Russia stands 16th, or 3d from the bottom in this list. Would not Dr. Fishberg agree that we are receiving in this country a vast number of undesirable people? The practical question arises whether under these circumstances intermarriage with other peoples in America is to be advised with the idea of raising the average quality of the American population.

DR. FISHBERG: The Jews constitute about one-quarter of 1 per cent of the world's population. . . . . Did you know that five or six Nobel prizes have been given to persons of Jewish descent? As regards ability otherwise, the Jews fill the colleges and universities, and if we take that as an index, Poland and Russia make a good showing.

SOME EUGENIC ASPECTS OF THE PROBLEM OF POPULATION

RAYMOND PEARL

ALES HRDLIČKA (following certain remarks by Dr. Dublin): I understand Professor Pearl's paper in a different way than Dr. Dublin. I understand that what Dr. Pearl has shown us here today is another example of those great and as yet but imperfectly known biological laws that apply to groups and whole varieties of beings, human and others, rather than to individuals.

But as to Dr. Pearl's conclusions for the future, I should like to point out some difficulties. That everything may not be as mathematically simple as would seem, is indicated, I think, by man's past history. Take any of Dr. Pearl's highly interesting curves and test its probability by the past. And go back along the line not merely a few generations, but the several hundred thousands of years, since the beginnings of humanity. This actual past you will find differs greatly from the curves as here forecast for the future.

The demographic progress of nations, of mankind as a whole, in the past has been such that we must assume the existence of many substantial events and perhaps even laws which made it what it was, and we may fairly expect that these and still other conditions will modify man's progress in numbers in the future. Mathematically, and for conditions like those at present, Dr. Pearl's curves are doubtless correct; but the past teaches us to be wary of rigid predictions.

COMMON LAW MARRIAGE AND ITS DEVELOPMENT IN THE UNITED STATES

Otto E. Koegel

Lucien Howe: It occurs to me that the importance of this paper is so great that it should not be passed without a word of appreciation. I think that the speaker did not have time to call attention to one of the maps. The states in which common law marriages are now valid, are represented in black; those in which they are not valid, are represented in red, and there are one or two in which their validity is still questionable.

The speaker did not lay much stress on the relation of such marriages to eugenics. But it is evident that if we want to improve the race we must have some legislation to regulate the question of common law marriage. To my mind that is fundamental.

PARENTHOOD IN RELATION TO EUGENICS

Harriette A. Dilla

Irving Fisher: I wish most heartily to second the suggestion in regard to the scientific study of birth control, from the eugenic standpoint. This Congress in general should not become confused with the protagonists of birth control. But we cannot ignore birth control. In fact, I think birth control is the most powerful new feature affecting the future character of the human race.

EUGENICS AS A FACTOR IN THE PREVENTION OF MENTAL DISEASE

Horatio M. Pollock

S. Adolphus Knopf: I would like to ask a question on the following case. A married woman bore a child; during her first pregnancy she showed symptoms of mental derangement but nothing was done. During her second pregnancy she became actively insane, but she was returned from the hospital as cured. The third child was born three years later. Active insanity ensued, she remained in a hospital four years and was then sent home reported as cured. What should have been done in this case?

Dr. Pollock: It is difficult to say what should be done in individual cases. After the mother had had one attack of mental disease during pregnancy, the good sense of both husband and wife should have prevented another pregnancy.

Question (questioner unknown): How do you determine the temperamental status of a patient?

Dr. Pollock: The behavior of the patient is studied from the psychological viewpoint and the entire history is considered. The hospitals get as much information as possible

from relatives, and social workers supplement the histories by field studies. All the reactions of the patient are considered and temperamental abnormalities are classified according to a definite scheme laid down by the Commission. There are many grades between the normal and the psychopathic; some are seclusive; some, over-active; some, unstable or paranoic. We try to separate the different classes and to determine their relation to the various forms of mental disease.

SOME LIMITATIONS OF PRESENT THEORIES

M. P. E. Groszmann

R. H. Johnson: I think that the author has been unfortunate in resting confidence in the results of Redfield. It seems to me that those conclusions are vitiated in so far as they are derived from the study of animals by the fact that in registered and high scoring animals the older sires are on the whole superior to the younger sires. When a sire has been used and found ineffective, his use is discontinued, whereas a successful sire is used for many years. In consequence, there is a superiority in the older sires partly as a result of selection.

In the case of man, I believe the results are somewhat vitiated owing to the fact that we have a longer generation in superior stocks from causes other than those to which Redfield ascribed them. In the superior stocks, we are getting retarded marriages and late child-births because of greater longevity. It therefore follows that in superior stocks there are more children born late in life than in inferior stocks. In this way Redfield has been led astray.

Judge Olson: The paper just read suggests the thought to me that not all of those who work with the Binet-Simon scale are competent to use it. Not all such workers are standardized. During the war many such people were working with this scale and the results secured are not dependable. When such workers are standardized the results secured by different workers or by the same worker at different times are almost identical. The total mental age varies but very little. I saw an illustration of that in our Laboratory. One boy was rated at eleven years of age by Mrs. Hickson, who has charge of this work under her husband, the Director. She taught the scale to another worker, who examined this same boy two years later and got the same result—eleven years. This worker taught her father the same methods she had learned, and two years later the father examined this boy with the same result—eleven years, identical with the other two independent demonstrators.

Not only were many of the Binet-Simon workers during the war not standardized, but a great many physicians employed as alienists did not recognize emotional defects. They understood intellectual but not emotional defects. I visited General Crowder during the war and at his request stepped into the department, where adjutant generals were reviewing sentences for crime in the army in this country and in France. It was quite noticeable that dementia praecox was not generally recognized.

Later I met Doctor Gorgas, and mentioned the fact to him. Dr. Gorgas determined to open a clinic under Dr. Hickson in Chicago, and under Dr. Southard at Boston, for physicians working with the Army, and he asked me to notify him upon his return from Europe, where he was then about to go, when we would be ready for him to give such clinics. We offered him a court-room, where we could accommodate seventy-five to one

hundred physicians, and promised to show them one hundred cases of mental defect per week. The armistice came while Dr. Gorgas was in Europe, and this clinic for the army was not opened.

Another thing, reliance must not be placed on the work in this field done in the emergency and pressure of war. The Binet-Simon scale in the hands of competent workers is a correct instrument. It will not disclose emotional defects to the ordinary worker, but will show differences of importance in that regard to experts.

The Association Test is a valuable one, as I can illustrate by a case that came to my notice. The youth gave as a reaction to a list of words, words related to fire, such as "hot," "burn," "blaze." He did this so often that these words were underscored with red ink in order to attract the attention of the judge. The judge in question on this particular day was from out of the city. He had had no psychological training. He ignored the warning contained in these reactions. The boy was placed on probation. Four months afterwards the insurance companies had to pay a policy of $200,000 for a fire that this youth started. So much for ignoring psychological warnings!

Arthur Goadby: We are hearing a good deal these days about Darwinian naturalistic evolution, and perhaps this theory is true, but if so, I am afraid it does not offer a very brilliant future for the world, if our much vaunted modern progress is in line with it, at least from the cultural human viewpoint, the only viewpoint worth considering. What is this so called "Modern Progress"? It seems to me to be a complex of false ideals—radical democracy, socialism, abstract education, materialistic science, agnosticism, struggle for wealth, extravagance, intolerance of diversity, and a determined attempt to crush all things and all people into the mould of mediocrity. Now these modern ideas may appear very fine and utopian to the majority, but of one thing we may be sure—they are very dysgenic, for they are leading to the infertility of the best elements of the population. Is it not a significant fact that the population of the world today is being recruited almost exclusively from those nations where monarchial traditions prevail? Now what is the reason for this? In my opinion the reason is this:—In monarchies there still linger that naive faith in spiritual things, a fervent love of country, pride in its past, hope for its future. And whatever may be their station in life under the monarchy, all the people possess this faith and vision and gladly make sacrifices for it and rejoice to bring children into the world to carry on that vision.

But while the fascinating and extraordinary discoveries that have been made in heredity and eugenics in the last fifty years have given a new hope to humanity, yet something more than the knowledge gleaned from these discoveries is needed if we would improve the quality of the race. We need, I believe, to realize the fatuity of many of our ideas of progress, and especially in the new and more radical democracies of the world, our own republic included, there is needed a revival of those spiritual and social ideals of the past—a love of beauty, a greater courtesy and repose of manner, a tolerance for and delight in diversity, an encouragement of excellence wherever found, a more sincere feeling of democracy and fellowship, a greater social stability, a more adaptable and practical education. Without these I think that the science of eugenics is helpless, with them it should regenerate the world.

THE HIGHER EDUCATION OF WOMEN AND RACE BETTERMENT

Louis I. Dublin

Dr. Koegel: It strikes me that the statistics contained in this paper have a distinct bearing on birth control. Evidently the married college graduate has been practising birth control. I do not suppose that there are or that there ever will be any statistics showing what number of children come into the world as the result of design and what number by accident. But it would seem that if the common people are educated to the question of birth control and practise it to the same extent to which it has been practised by college graduates, it would have a disastrous effect on the race.

Dr. Paton: Might I take this opportunity of emphasizing one phase of the seriousness of the educational situation. We have more patients in hospitals for the insane in the United States than we have students in colleges and universities. During the years that we were building the Panama Canal we spent one hundred and fifty million dollars more on maintaining asylums for the insane than we spent on building the Panama Canal.

The educators today should be held responsible for some of the failures to adjust life that are called nervous and mental disease. One of the chief failures of the educator is that he insists on trying to fit people for occupations and professions before he knows what those people are physically or mentally fitted for.

One of the great menaces of our civilization today is emotional instability. Is man capable of using what brain-power he possesses to control the civilization he has created? The really great problem of education is not how to prepare students to pass examinations but to prepare them to live. In order to insure success in living we must find out what a student is emotionally as well as intellectually prepared for.

The same holds true for the education of women. Although we are disgusted with the education that we try to give to men today, yet we adopt for women the system that we are almost prepared to give up for men.

Willystine Goodsell: I have been very much interested in this question for the past two or three years. If I may be permitted, there are certain facts which I desire to state that should be kept in mind in making a fair judgment on this question.

First, almost all the figures regarding the marriage rate of college women are drawn from the eastern colleges for women, where girls between eighteen and twenty-two are segregated and do not have natural every day associations with men. Under these conditions young women make for themselves a pleasant and varied college life woven almost entirely out of feminine materials.

Secondly, it seems not altogether scientific to compare the low marriage rate among college graduates with the census rate for all women of marriageable age. To secure a fair basis of comparison we should compare the marriage rate of college women with that of their sisters and cousins in the same walk of life. Unfortunately this study has not been made, although there is real need for it. However, a comparative study of the birth rates in these two selected groups has been made. About fifteen years ago, this investigation was undertaken by Dr. Mary Roberts Smith, who compared the birth rate in a group of over three hundred married college graduates with that of an approximate number of their sisters and cousins of the same social class. Her conclusions are interesting. Let Class A represent the college group and Class B the non-college group. The results show that although the sisters and cousins in Class B had more children absolutely, the Class A group of college women had more children per year of married life.

We need further controlled statistics of that kind, comparing college women with the sisters and cousins of the same social scale before we can say that college education is responsible for the low marriage rate among college women. It seems highly probable that in the prosperous middle class from which college women are largely drawn there is a relatively lower marriage rate than in the laboring group or the group of the very rich.

College education does for women precisely what college education does for men. It individualizes them. It makes of young women developed individuals looking out into a world of broadening opportunity. Naturally they are going to select from that world the elements which will make for them a satisfying life, not merely in the sense of self-expression but in the finer sense of opportunity to perform socially useful work. It may be that by extolling home economics in colleges, by offering courses in eugenics and in the social history of the family, we may raise the marriage rate among college women. But I doubt whether education can accomplish much by these methods. The low marriage rate among college women is an index of a deep social movement. We do not know whither it is going.

Let me add that I think the speaker was perfectly correct in saying that our present social organization should be more flexible with respect to the needs of the professionally trained married woman who wants part time work or a full day's work outside the home. At present society virtually says to these highly educated women who marry: "There is one vocation for you—home-making and child-bearing;" while it says to her brother: "The whole field of professional opportunity" is open to you, nor shall you be denied the joys of marriage and fatherhood in addition.

Dr. Robie: I have no quarrel with anything that was said. In fact, I agree with everything that was said; but I merely wish to add a corollary or two.

The speaker said: "At present, college education for women has a dysgenic influence." Personally, I see no reason for its having such an influence. It is a fact, however, that too little attention is paid to biological science; and that is one of the causes of the failure of the education of women.

But I have a special point that I wish to present; and perhaps I can illustrate it by a single case. Within twenty-four hours I have talked with a college woman, forty years of age, who is about to be married. She bemoans the fact that she has never been in love until now. This lady, when she was seven or eight years old, had an experience, which was no fault of hers, with an elderly man, which caused a shock to her system. This was never explained. She never talked this matter out. No one ever talked to her about the fundamental things that we are talking about. This girl was never taught a thing about sex in her childhood, nor during her college course. She grew up with a fear of men. She has had that fear of men till about two years ago, when she obtained some reading along the lines of sex hygiene, and determined for herself the reason for this fear. Now she has fallen in love with a man, and intends to marry him. Her reason for talking with me was to find out whether or not she would be capable of bearing children, at her age.

If you put into the curriculum of your women's colleges a course in mental hygiene, involving sex hygiene, it will help a great deal to do away with the reason why a great many college women do not marry. I could give you readily fifty illustrations similar to the above.

One reason why college women do not marry, and one reason why young men do not want them, is because they have a feeling of fear, self-consciousness, and self-depreciation. They keep aloof from young men, but they must do something; so they develop an interest

in law, science, medicine, teaching, journalism; and they procrastinate in the matter of marriage until they obtain a rational view of marriage and the sex relation, when it is late, or too late.

A gentleman spoke just now about college women and birth control. What he said is doubtless true; but it does not apply to college women any more than it applies to women of any one of the intelligent classes. Birth regulation is something that has come to stay. There is already intelligent control of birth among the educated; and it seems to me that it would be wise to have something done by national legislation to promulgate information among the unintelligent and the indigent, so that similar control would be exercised among these classes.

This would have a most healthful influence on the race, and would be of the greatest benefit to civilization and progress. We must do something along this line, or where will the English speaking race be very soon?

JUDGE OLSON (chairman): It seems to me what should most concern us is not whether college women have more children but whether women with good minds in sound bodies have more children. Not all women who attend college have superior minds. After all, college women of good minds are few as compared to the many women of such minds who never enter college.

There are a very large number of women of good character, keen intellects, and capable of being splendid mothers, who bring few, if any, children into the world. This failure should concern us more than the fact that the higher education of women brings about a limited off-spring.

Education is often over-estimated. We can not better the race by educational methods. Culture is not inheritable. We see this illustrated in the self-made man, who has been a great success. He is successful by reason of his hereditary ability, an ability that education can develop, but not create. An ignorant peasant with a good mind in a sound body will produce better children than a college-bred of poor heredity.

The tendency of our educated people of good mentality to limit their families is to be discouraged. It is important for the nation and the race that our superior stocks should reproduce themselves.

THE NATURE-NURTURE ISSUE IN ITS BEARING UPON GOVERNMENT

ALLEYNE IRELAND

JUDGE OLSON: Mr. Ireland suggests that there is a conflict as to whether nature or nurture controls. That issue has already been settled. Every farmer knows he can not convert scrubs into pure-bred stock merely by improving the food and the environment. In order to produce a pure-bred animal the farmer knows he must have pure-bred ancestors, and that environment will not of itself convert inferior stock into pure-breds. Environment can only be effective when there is an initial inheritance to work upon.

EUGENICAL STERILIZATION IN THE UNITED STATES

HARRY H. LAUGHLIN

DR. FISHER: I should like to ask when the operations referred to in Indiana and Connecticut were performed. I understand that Indiana tried it under Dr. Sharp and dropped it after about a thousand operations had been performed.

Dr. Laughlin: Several hundred before the statute was enacted. Nearly all of them were performed in the Reformatory at Jeffersonville, an institution for young men. These operations were performed by Dr. Harry C. Sharp, who began this work in 1899, eight years before the law was enacted, and later sought legislative authorization. After the thing was done the law was enacted; under the law only one hundred and twenty cases were performed. These operations ceased in Indiana because Governor Marshall, who later became vice-president of the United States, told the superintendents of the subject institutions that if they continued them, he would veto their appropriations. The work fell into disuse, and finally the Supreme Court of Indiana (1921) declared the law as written, unconstitutional, on the usual grounds of lack of due process of law and its being a bill of attainder.

Dr. Fisher: I thought it was a dead law in Connecticut.

Dr. Laughlin: It is now, but while active, seven or eight years ago, 27 operations were performed by Dr. Pollack in the hospital for the insane at Norwich.

Dr. Koegel: When the law is declared illegal, and it is so when it is declared unconstitutional, does that create any damage suits?

Dr. Laughlin: None up to the present time, although in many states the institution officials have been obliged to discontinue the use of the law because of the fear that they would be held personally liable. In most, but not all of the states, the laws have been used principally in voluntary cases, in which cases, of course, there has been no fear of damage suits.

In a test case in New Jersey there was an injunction issued against the superintendent of the institution preventing him from performing the proposed operation. That is why in this state the law was held unconstitutional. If Alice Smith, the subject of the test case, had been operated upon subsequently to the injunction, her family could probably have gotten damages.

Dr. Key: I should like to ask the speaker if he attaches any significance to the fact that the states that have passed the law are western and those that have not are eastern. Is it due to the superior foresight of the western states?

Dr. Fisher: In the East anything that is new is scandalous.

THE SOCIAL EVIL IN RELATION TO EUGENICS

Daisy M. O. Robinson

Dr. Fisher: We are apt to think that environment and manner of life cannot affect the next generation. Shell shock, malnutrition, poisoning from alcohol or tobacco, possibly tea and coffee, etc., we think are not inherited, yet there may be something very much like such inheritance, in the practical sense. Whether there is inheritance in the biological sense is not the only matter. We are anxious to make a more perfect mankind and we are interested in the practical side of it. I should like to take this opportunity of emphasizing the importance of uniting the study of Hygiene and Eugenics.

Dr. Groszmann: I was greatly interested in this paper as it would seem to throw light on some obscure cases. We are sometimes confronted with conditions which appear to be unexplained. As the speaker said, a child may grow up normal to all appearances until he reaches his tenth year; in the eleventh, all of a sudden some degenerate traits crop out for which there does not seem to be any explanation.

Only today I had under my observation a boy of fifteen who suffered from poor motor coördination which also affected his speech very materially. He had been backward in many ways, without being really defective in intelligence; that is to say, he seemed decidedly teachable and to possess power of judgment. The parents come from a healthy stock as far as was ascertainable. There seemed to be no syphilitic taint. Yet, whether or not such a taint might not be found if we could go back far enough in the history of the family I cannot say. But it would seem that cases of this kind, obscure as they seem to be in their etiology, may be eventually cleared up by investigations like those undertaken by Dr. Robinson.

She stated that luetic infection is as old as the hills. This being admitted, we may conclude that there must have been a diminution of this scourge during the process of higher civilization. Has it been possible to say with any degree of accuracy whether this is so, or is the proportion of cases about the same now as it ever was, or has there been an increase?

If the scourge has been so wide-spread in previous centuries as we are justified to believe, why is it that not all of us are affected, or infected? What agent has there been at work to eliminate the danger? If there has been one, what is it? Can it be traced? I should be glad to have some light on this subject.

Dr. Howe: If the Wassermann test were made in every case before marriage as it is now required, I am told, in at least two states, the terrible effects of hereditary syphilis would be greatly lessened.

Yesterday in one of the section meetings I asked the members for a definition of heredity but received none which would seem to include defects resulting from infections.

THE MEDICAL APPLICATION OF THE IMMIGRATION LAW

W. C. Billings

Dr. Mitten: I should like to ask what is your opinion as to the advisability of examining the immigrant on the other side?

Dr. Billings: That is a question which has been subject to a great deal of discussion for a number of years. In 1899 we sent thirteen officers abroad to do that and only one was able to stay for any length of time. The steamship companies did not like it. It interfered with the volume of traffic. It may be brought about, but how it will be worked out I do not think anybody can say until it is tried.

There are a great many factors that enter into this problem and pressure will be brought in foreign parts to pass these immigrants. It is amazing to see the amount of pressure that is brought.

Dr. Fisher: What is the nature of the pressure, friendly, political?

Dr. Billings: They will appeal to his heart, to his charity, to pity, or anything that they think might induce him to let this "poor person" go to America because his relatives are there, etc.

I do not think the steamship companies will welcome it. At present they get the passage money, and it costs little to send the immigrant back if he is found inadmissible. The steerage is more or less empty on the return trip and, therefore, the deported immigrant is not occupying the space that could be sold to another, and the food for the return trip costs little.

Personally, for many reasons, I fear that the proposed plan of examining on the other side will not eventuate as favorably as many think it will.

Dr. Mitten: It seems to me that it is not a question of pity, but merely if he has a disease or if he has not one; that is all there should be to it.

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PLATES

PLATE 1. EUGENICAL CLASSIFICATION OF THE HUMAN STOCK

Exhibited by the Eugenics Record Office

EUGENICAL CLASSIFICATION OF THE HUMAN STOCK.

BASIS:- The manner in which families assemble in their offspring heritable traits which determine their possessors (a) social adjustment and (b) special talent or defect. Since civilization began there have been born and reared in civilized countries approximately sixty billion (60,000,000,000) persons.

EUGENICAL END PRODUCTS AND THEIR RELATIVE FREQUENCY.

I. PERSONS OF GENIUS:-

THESE 1,000 PERSONS MOST SPLENDIDLY EQUIPPED BY NATURE IN ALL HISTORIC TIME.
INCIDENCE IN THE TOTAL POPULATION OF CIVILIZED NATIONS. APPROXIMATELY- 1/60,000,000.

GENERALLY MANIFEST IN SUCH COMPLEX QUALITIES AND ARTS AS:-

1. LAWGIVING - e.g. - MOSES; ALFRED THE GREAT.
2. LEADERSHIP - e.g. - CHARLEMAGNE, WASHINGTON.
3. MORAL PURPOSE - e.g. - LUTHER; LINCOLN.
4. WARFARE - e.g. - HANNIBAL; GUSTAVUS; ADOLPHUS.
5. PHILOSOPHY - e.g. - ARISTOLE; BACON.
6. RELIGION - e.g. - CONFUCIUS; SAVONAROLA.
7. EDUCATION - e.g. - PESTALOZZI; HORACE MANN.
8. ORATORY - e.g. - CICERO; WEBSTER.
9. MATHEMATICS - e.g. - EUCLID; LEIBNITZ.
10. SCIENCE - e.g. - NEWTON; DARWIN.
11. MEDICINE - e.g. - HIPPOCRATES; PASTEUR.
12. INVENTION - e.g. - GUTENBERG; BELL.
13. ENGINEERING - e.g. - ARCHIMEDES; HERRESHOFF.
14. ARCHITECTURE - e.g. - ICTINUS; MICHAEL ANGELO.
15. SCULPTURE - e.g. - PHIDAS; RODIN.
16. PAINTING - e.g. - RAPHAEL; REMBRANDT.
17. MUSIC - e.g. - WAGNER; JENNY LIND.
18. POETRY - e.g. - DANTE; GOETHE.
19. DRAMA - e.g. - EURIPIDES; SHAKESPEARE.
20. HISTORY - e.g. - PLUTARCH; GIBBON.
21. FICTION - e.g. - HUGO; DICKENS.
22. POLITICS - e.g. - PLATO; HAMILTON.
23. STATESMANSHIP - e.g. - MICHELIEU; ELIZABETH.
24. DISCOVERY - e.g. - MARCO POLO; COLUMBUS.
25. BUSINESS - e.g. - CECIL RHODES; ROTHSCHILD.
26. PHYSICAL PROWESS - e.g. - PHIDIPPIDES; SANDOW.

ETC; ETC; ETC

EUGENICALLY FIT FROM STERLING INHERITANCE. The families which produce the socially valuable 9/10 of humanity among civilized people.

II. PERSONS OF SPECIAL SKILL, INTELLIGENCE, COURAGE, UNSELFISHNESS, ENTERPRISE, OR STRENGTH.

INCIDENCE IN THE TOTAL POPULATION POSSIBLY 1/1000.
THE NATURAL AND ACKNOWLEDGE LEADERS IN ALL LINES OF HUMAN ENDEAVOR.
"THE WHO'S WHO" PEOPLE.

III. PERSONS CONSTITUTING THE GREAT NORMAL MIDDLE CLASS- "THE PEOPLE".

INCIDENCE IN THE TOTAL POPULATION PROBABLY 9/10.
(THE FRACTIONS 1/60,000,000 AND 1/1000 ARE PRACTICALLY NEGLIGIBLE IN SO ROUGH A CALCULATION).

EUGENICALLY UNFIT FROM DEFECTIVE INHERITANCE. The cacogenic families which produce the socially inadequate 1/10 of humanity among civilized people.

I. SOCIALLY INADEQUATE PERSONS.

INCIDENCE OF FREQUENCY OF SUCH PERSONS TOGETHER WITH THE STOCK THAT PRODUCES THEM IN THE TOTAL POPULATION PROBABLY 1/10.

1. FEEBLEMINDED
2. PAUPEROUS
3. INEBRIATE
4. CRIMINALISTIC
5. EPILEPTIC
6. INSANE
7. ASTHENIC
8. DIATHETIC
9. DEFORMED
10. CACAESTHENIC

THE TASK OF EUGENICS:-

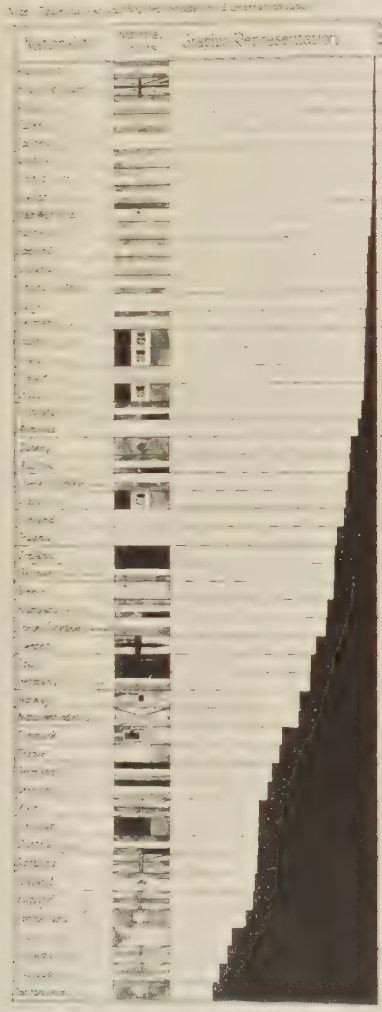
(a) To encourage fit and fertil matings among those persons most richly endowed by nature; and
(b) to devise practicable means for cutting off the inheritance lines of persons of natural meagre or defective inheritance.

PLATE 2. INTERMARRIAGE OF NATIONALITIES IN NEW YORK CITY

Proportion of marriages among men and women in New York City who belong to different nationalities. Exhibit by Julius Drachsler, Smith College

CHART IV

Proportion of Intermarriage among Men and Women (1st and 2nd Generation) of Various Nationalities in New York City (1908-1912)



45	2646	12
48	1666	8
62	37768	235
80	371	3
93	6641	62
99	14032	139
108	4784	52
117	65199	763
144	138	2
224	4862	109
347	403	14
400	100	4
426	1429	61
463	151	7
516	3486	180
558	13140	734
583	8411	491
654	91	6
676	23811	1615
859	733	63
963	166	16
1315	228	30
1356	5197	705
1409	3597	507
1673	2330	390
1682	850	143
2025	1896	384
2159	18547	4005
2168	12724	3759
2214	560	124
2441	1061	259
2515	1451	365
3104	2100	652
3311	311	103
3334	14979	4994
3914	700	274
3986	153	61
4742	563	267
4955	1455	721
5305	933	495
5598	1322	740
5944	143	85
5963	218	130
5971	988	590
5979	1557	931
6258	294	184
6270	3614	2266
6636	686	456
7373	99	73
7560	164	124
7985	705	563
8208	67	55

NOTE.—With regard to the ratio of intermarriage, the various nationalities range themselves in an ascending scale. Of the most important groups represented, the Jews and the Negroes are lowest, the Italians are next, the Irish are higher than the Italians and the Northern, North-Western and some Central European peoples are highest.

PLATE 3. SWISS FOLK TYPES

Exhibited by Prof. B. F. Beck, Geneva, Switzerland

Swiss Folk Types
Exhibited by
Prof. R. F. Beck
Geneva, Switzerland.

Plate 4. Dutch Folk Types

Exhibited by Jon Von Der Speck, Den Dolder, Holland

Dutch Folk Types
Exhibited by
Jos Van Der Speek
Den Helder, Holland

PLATE 5. HAWAIIAN, AND HAWAIIAN HYBRIDS

1. Pure Hawaiian.
2. Father French, mother Hawaiian.
3. Father Portuguese, mother Hawaiian.
4. Father Chinese, mother Hawaiian.
5. Father Chinese, mother Hawaiian.
6. Father Irish, mother Hawaiian.
7. Father Filipino, mother Hawaiian
8. Father Filipino, mother Hawaiian.
9. Father American-Tahitian, mother Hawaiian.

The photographs were taken by Mrs. C. H. Gurrey of Honolulu. Exhibited by Prof. A. M. Tozzer, Harvard University

Plate 6. A Century of Change in Hawaii's Population

By Louis R. Sullivan

A CENTURY OF CHANGE IN HAWAII'S POPULATION
HAWAIIAN
PART HAWAIIAN
AMERICAN, BRITISH, ETC.
CHINESE
JAPANESE
PORTUGUESE

PLATE 7. MISCEGENATION IN HAWAII

Analysis of 14,569 unselected marriages in the Hawaiian Islands. Percentages of grooms marrying brides of the same and different national descent. Louis R. Sullivan

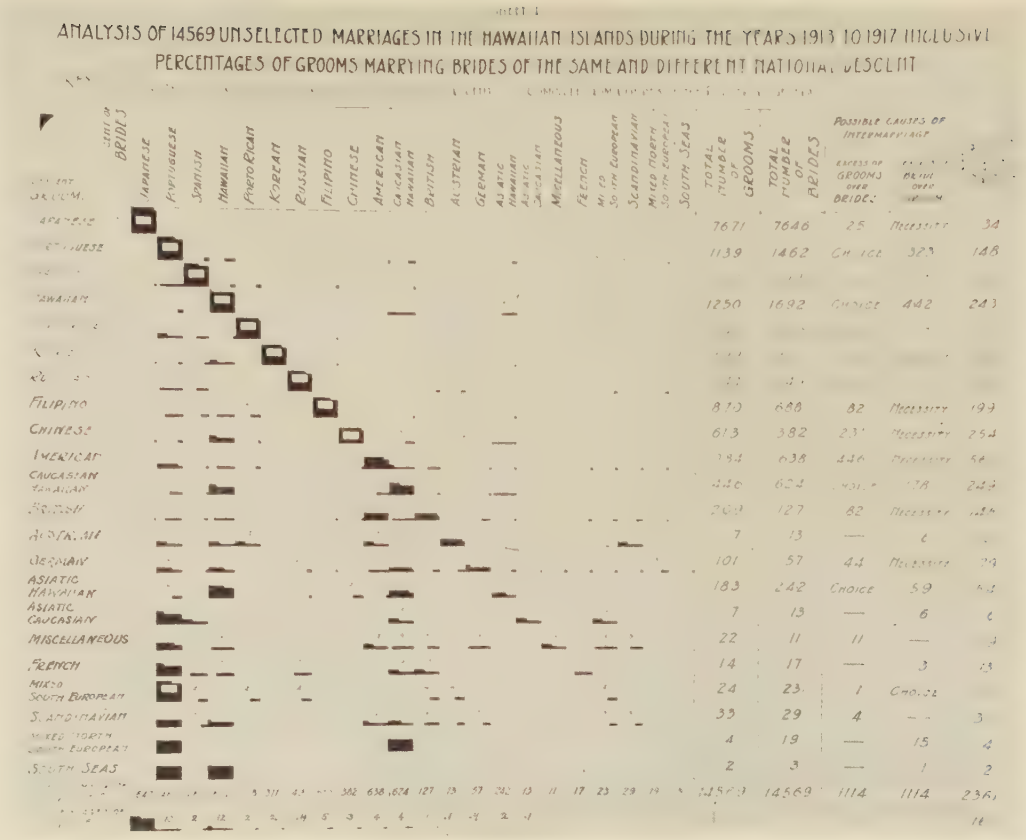

ANALYSIS OF 14569 UNSELECTED MARRIAGES IN THE HAWAIIAN ISLANDS DURING THE YEARS 1913 TO 1917 INCLUSIVE
PERCENTAGES OF GROOMS MARRYING BRIDES OF THE SAME AND DIFFERENT NATIONAL DESCENT
JAPANESE
PORTUGUESE
SPANISH
HAWAIIAN
PORTO RICAN
KOREAN
RUSSIAN
FILIPINO
CHINESE
AMERICAN
CAUCASIAN HAWAIIAN
BRITISH
AUSTRIAN
GERMAN
ASIATIC HAWAIIAN
ASIATIC CAUCASIAN
MISCELLANEOUS
FRENCH
MIXED SOUTH EUROPEAN
SCANDINAVIAN
MIXED NORTH SOUTH EUROPEAN
SOUTH SEAS
TOTAL NUMBER OF GROOMS
TOTAL NUMBER OF BRIDES
POSSIBLE CAUSES OF INTERMARRIAGE
EXCESS OF GROOMS OVER BRIDES
BRIDE OVER GROOM
FILIPINO 7671 7646 25 NECESSITY 34
CHINESE 1139 1462 CHOICE 323 148
AMERICAN 1250 1692 CHOICE 442 243
FILIPINO 870 688 82 NECESSITY 197
CHINESE 613 382 231 NECESSITY 254
AMERICAN 944 638 446 NECESSITY 54
CAUCASIAN HAWAIIAN 446 624 CHOICE 178 244
BRITISH 209 127 82 NECESSITY 123
AUSTRIAN 7 13 — 6
GERMAN 101 57 44 NECESSITY 79
ASIATIC HAWAIIAN 183 242 CHOICE 59
ASIATIC CAUCASIAN 7 13 — 6
MISCELLANEOUS 22 11 11 —
FRENCH 14 17 — 3 13
MIXED SOUTH EUROPEAN 24 23 1 CHOICE
SCANDINAVIAN 33 29 4 3
MIXED NORTH SOUTH EUROPEAN 4 19 — 15 4
SOUTH SEAS 2 3 — 1 2
14569 14569 1114 1114 2361

PLATE 8. THE AVERAGE AMERICAN MALE

Statuette of man having the average proportions of 100,000 white soldiers at demobilization as determined by the United States War Department. By Jane Davenport

PLATE 9. RACIAL DIFFERENCES IN MENTAL FATIGUE

Charts showing comparative mental fatigue in Indian, White and Negro children.
Shown by Dr. Thos. R. Garth

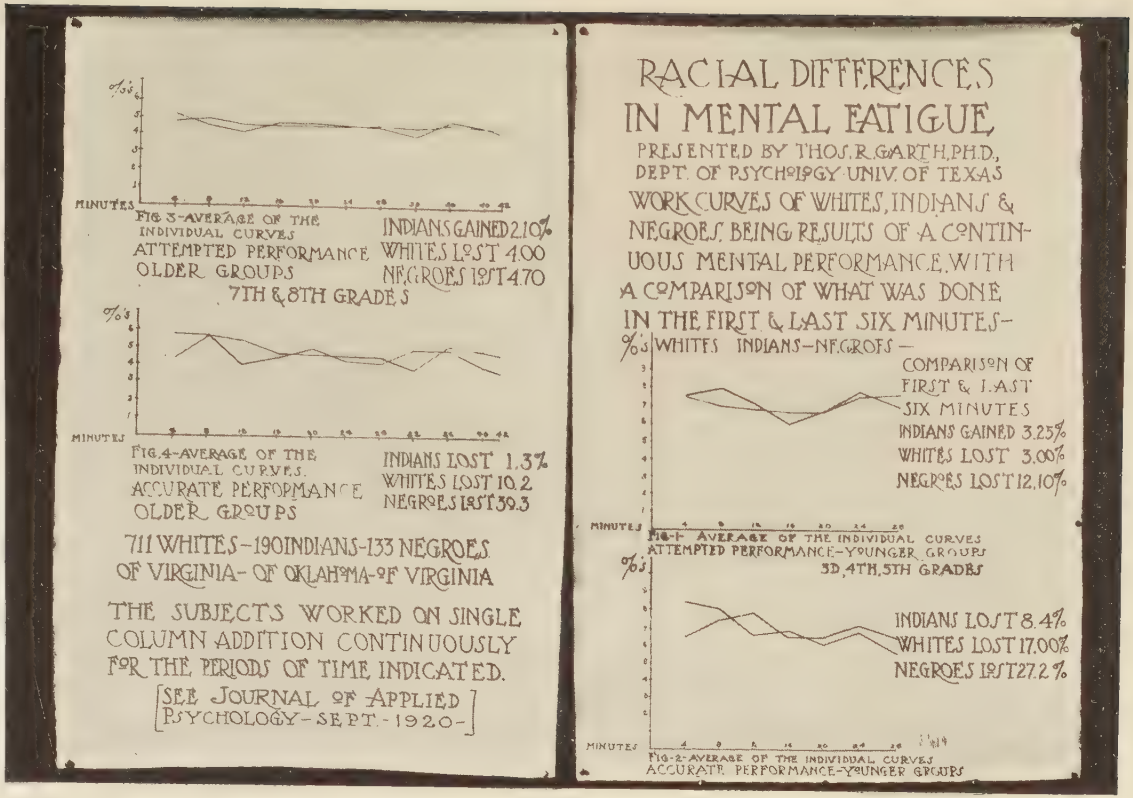

%'s
MINUTES
FIG 3-AVERAGE OF THE INDIVIDUAL CURVES ATTEMPTED PERFORMANCE OLDER GROUPS 7TH & 8TH GRADES
INDIANS GAINED 2.10%
WHITES LOST 4.00
NEGROES LOST 4.70
%'s
MINUTES
FIG.4-AVERAGE OF THE INDIVIDUAL CURVES. ACCURATE PERFORMANCE OLDER GROUPS
INDIANS LOST 1.3%
WHITES LOST 10.2
NEGROES LOST 39.3
711 WHITES-190 INDIANS-133 NEGROES OF VIRGINIA- OF OKLAHOMA-OF VIRGINIA
THE SUBJECTS WORKED ON SINGLE COLUMN ADDITION CONTINUOUSLY FOR THE PERIODS OF TIME INDICATED.
[SEE JOURNAL OF APPLIED PSYCHOLOGY-SEPT.-1920-]
RACIAL DIFFERENCES IN MENTAL FATIGUE
PRESENTED BY THOS. R. GARTH, PH.D., DEPT. OF PSYCHOLOGY UNIV. OF TEXAS
WORK CURVES OF WHITES, INDIANS & NEGROES. BEING RESULTS OF A CONTINUOUS MENTAL PERFORMANCE, WITH A COMPARISON OF WHAT WAS DONE IN THE FIRST & LAST SIX MINUTES-
%'s WHITES INDIANS-NEGROES-
COMPARISON OF FIRST & LAST SIX MINUTES
INDIANS GAINED 3.25%
WHITES LOST 3.00%
NEGROES LOST 12.10%
MINUTES
FIG-1 AVERAGE OF THE INDIVIDUAL CURVES ATTEMPTED PERFORMANCE-YOUNGER GROUPS 3D, 4TH, 5TH GRADES
%'s
INDIANS LOST 8.4%
WHITES LOST 17.00%
NEGROES LOST 27.2%
MINUTES
FIG-2-AVERAGE OF THE INDIVIDUAL CURVES ACCURATE PERFORMANCE-YOUNGER GROUPS

Plate 10. The Comparative Increase of Population of the Principal Countries.

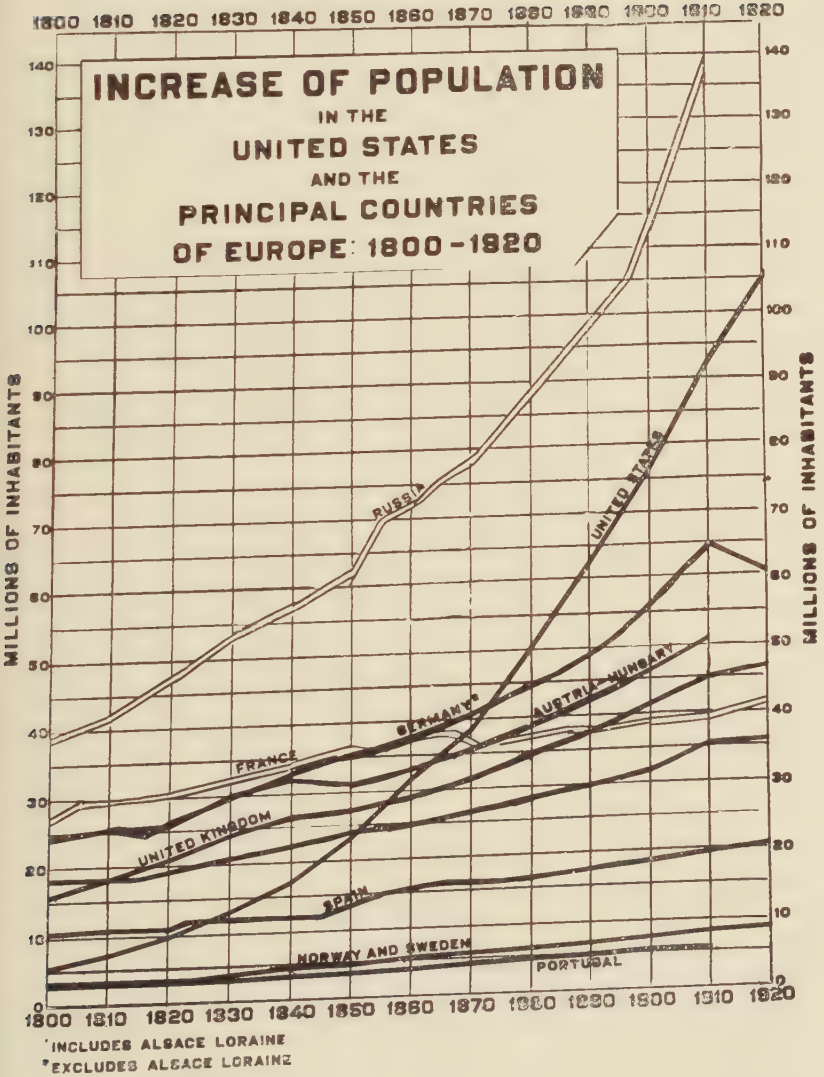

INCREASE OF POPULATION
IN THE
UNITED STATES
AND THE
PRINCIPAL COUNTRIES
OF EUROPE: 1800-1920
MILLIONS OF INHABITANTS
MILLIONS OF INHABITANTS
1800 1810 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920
RUSSIA
UNITED STATES
GERMANY*
AUSTRIA-HUNGARY
FRANCE
UNITED KINGDOM
SPAIN
NORWAY AND SWEDEN
PORTUGAL
*INCLUDES ALSACE LORAINE
*EXCLUDES ALSACE LORAINE

Plate 11. Comparison of White and Negro Fetuses

An exhibit prepared by Dr. A. H. Schultz of the Department of Embryology, Carnegie Institution of Washington, deals with racial differences during prenatal development of man. It is based upon researches on 455 white and 168 negro fetuses ranging in age from the ninth to the fortieth week of intrauterine life. Fourteen plaster casts of white and negro specimens and ten large tables illustrate the chief points of difference in fetuses of the two races and in which periods of development they are most distinct. Of these differences the following may be enumerated:

The average of the upper arm-forearm index for every week of fetal life is larger in the negro than in the white, showing that the forearm in relation to the upper arm is longer in negro fetuses. In an analogous way the leg in relation to the thigh was found to be longer in negro fetuses, a difference which becomes more pronounced with advancing development. The hand as well as the foot is slightly shorter and broader in white fetuses. In the latter, fingers II and IV are of equal length in the great percentage of cases and frequently finger II is even longer than finger IV; while in the negro the relation in length between these two fingers is more often in favor of finger IV and the latter is never shorter than finger II. The length of the thumb in relation to the total hand length is shorter in the negro, a difference which is constant and rather marked throughout intrauterine development. The first toe is the longest in a greater percentage of white than of negro fetuses, while the second toe is longest in a greater percentage in the negro. In the latter race the heel is more prominent than in the white. The trunk shows no racial differences. Of the head, the brain part is proportionately smaller and the face part larger, particularly in height, in negro fetuses. The nose is relatively shorter and broader in negro fetuses in all stages of development, causing a very marked difference in the nasal index of the two races. During the later part of pregnancy the nostrils are directed transversely in the negro and sagittally in the white. The lips are much thicker in negro fetuses.

2600 Negro

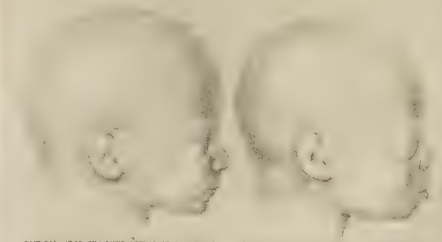
PLATE 12. DIFFERENCE BETWEEN WHITE AND NEGRO FETUSES

BASED UPON OBSERVATIONS ON 455 WHITE AND 165 NEGRO SPECIMENS RANGING FROM THE 9th TO THE 40th WEEK OF PRENATAL DEVELOPMENT.

DR. ADOLPH H. SCHULTZ. CARNEGIE INSTITUTION OF WASHINGTON, DEPT. OF EMBRYOLOGY.

TABLE 6

DIFFERENCES BETWEEN THE HEADS OF WHITE AND NEGRO FETUSES



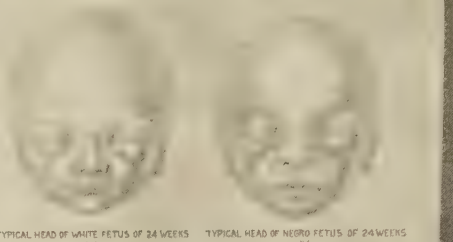
TYPICAL HEAD OF WHITE FETUS OF 24 WEEKS X4

TYPICAL HEAD OF NEGRO FETUS OF 24 WEEKS X4

BRAIN PART OF HEAD SMALLER, FACE PART LARGER, AND NOSE SHORTER AND FLATTER IN THE NEGRO

TABLE 7

DIFFERENCES BETWEEN THE HEADS OF WHITE AND NEGRO FETUSES



TYPICAL HEAD OF WHITE FETUS OF 24 WEEKS X4

TYPICAL HEAD OF NEGRO FETUS OF 24 WEEKS X4

FACE HIGHER, NOSE BROADER, AND LIPS THICKER IN THE NEGRO. NOSTRILS DIRECTED TRANSVERSELY IN THE NEGRO, AND SAGITTALLY IN THE WHITE

TYPICAL FOOT OF WHITE FETUS OF 30 WEEKS X4

TYPICAL FOOT OF NEGRO FETUS OF 30 WEEKS X4

FOOT OF NEGRO FETUS SLIGHTLY LONGER AND NARROWER THAN THAT OF WHITE FETUS

TABLE 4

DIFFERENCES BETWEEN THE FEET OF WHITE AND NEGRO FETUSES

TYPICAL HEEL OF WHITE FETUS

TYPICAL HEEL OF NEGRO FETUS

NOTE THE GREATER PROMINENCE OF HEEL IN NEGRO FETUS

TYPICAL HAND OF WHITE FETUS OF 30 WEEKS X5

TYPICAL HAND OF NEGRO FETUS OF 30 WEEKS X5

TABLE 3

DIFFERENCES BETWEEN THE HANDS OF WHITE AND NEGRO FETUSES

THE HAND IS RELATIVELY BROADER AND SLIGHTLY SHORTER AND THE THUMB RELATIVELY LONGER IN THE NEGRO FETUS THAN IN THE NEGRO FETUS (SEE RELATIVE LENGTH OF THUMB ON TABLE 5)

FINGERS	3d MONTH	4th MONTH	5th MONTH	6th MONTH	7th MONTH	8th MONTH	9th MONTH	10th MONTH
II & IV	WHITE NEGRO	WH. N.	WH. N.	WH. N.	WH. N.	WH. N.	WH. N.	WH. N.
IV > II	33.3 5[illegible] .47	50.0 4.3	47.1 10.4	42.0 2.[illegible]	52.9 20.0	35.0 [illegible]	[illegible]	[illegible]
IV = II	64.7 42.9	69.6 50.0	64.3 52.9	74.6 55.0	66.7 47.1	66.[illegible]	[illegible]	[illegible]
IV < II	2.0 -	16.3 -	21.4 -	15.0 -	12.[illegible]	3.3	[illegible]	[illegible]

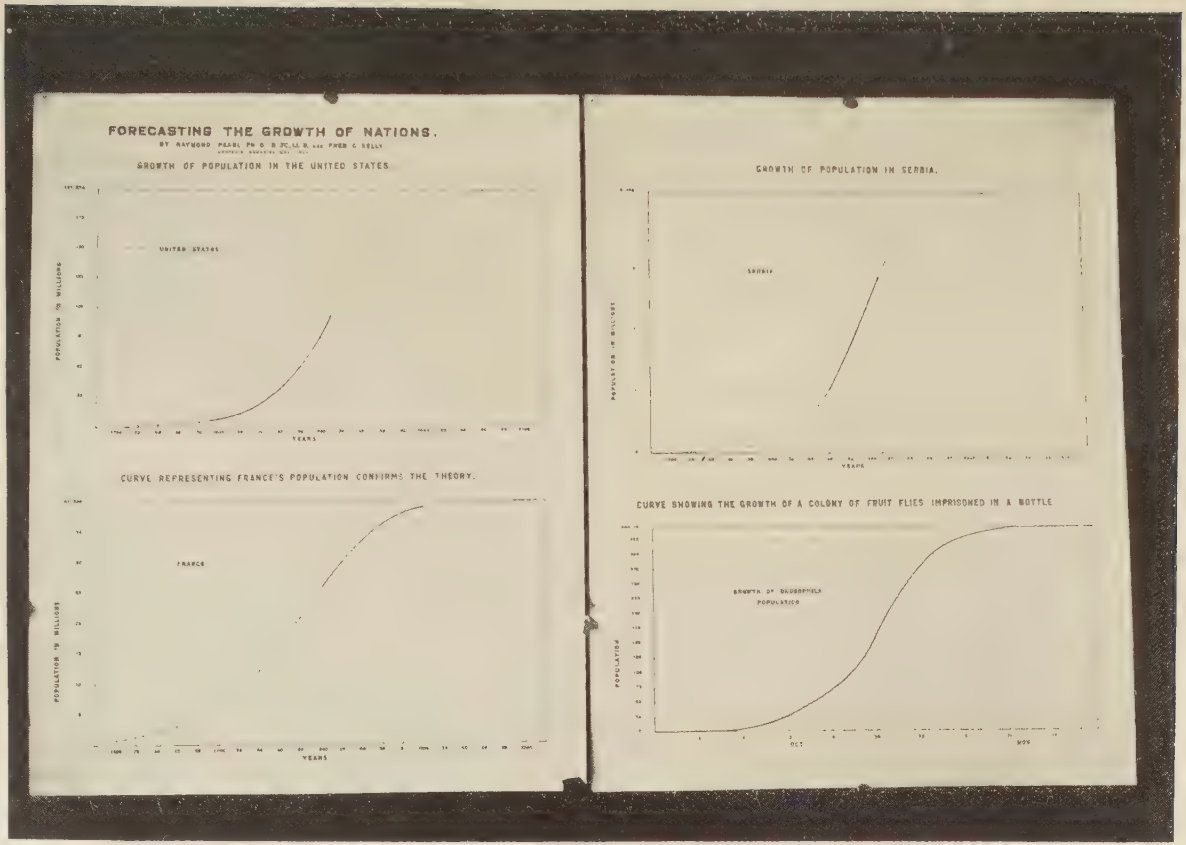
TABLE SHOWING RELATION IN LENGTH BETWEEN FINGERS II & IV IN THE VARIOUS MONTHS OF PREGNANCY, EXPRESSED IN PERCENTAGES OF CASES

	3d MONTH		4th MONTH		5th MONTH		6th MONTH		7th MONTH		8th MONTH		9th MONTH		10th MONTH	
	WHITE	NEGRO	WH.	N	WH.	N	WH.	N	WH.	N	WH.	N	WH.	N	WH.	N
.	—	—	17.1	5.5	15.5	5.9	22.7	10.0	39.4	11.7	53.3	22.2	53.4	25.0	77.3	50.0
I & II	3.9	—	43.4	5.5	44.0	20.6	39.4	35.0	36.4	47.1	26.7	44.5	33.3	40.0	13.6	18.2
II	90.2	100.0	39.5	89.0	40.5	73.5	37.9	55.0	24.2	41.2	20.0	33.3	13.3	35.0	9.1	31.8
II & III	5.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

TABLE SHOWING RELATION IN LENGTH BETWEEN FINGERS II & III IN THE VARIOUS MONTHS OF PREGNANCY, EXPRESSED IN PERCENTAGES OF CASES

PLATE 13. FORECASTING THE GROWTH OF NATIONS

Theoretical curves of growth of various nations and a colony of fruit flies
Dr. Raymond Pearl


FORECASTING THE GROWTH OF NATIONS.
GROWTH OF POPULATION IN THE UNITED STATES.
UNITED STATES
POPULATION IN MILLIONS
YEARS
CURVE REPRESENTING FRANCE'S POPULATION CONFIRMS THE THEORY.
FRANCE
POPULATION IN MILLIONS
YEARS
GROWTH OF POPULATION IN SERBIA.
SERBIA
YEARS
CURVE SHOWING THE GROWTH OF A COLONY OF FRUIT FLIES IMPRISONED IN A BOTTLE
GROWTH OF DROSOPHILA POPULATION
POPULATION
OCT.
NOV.

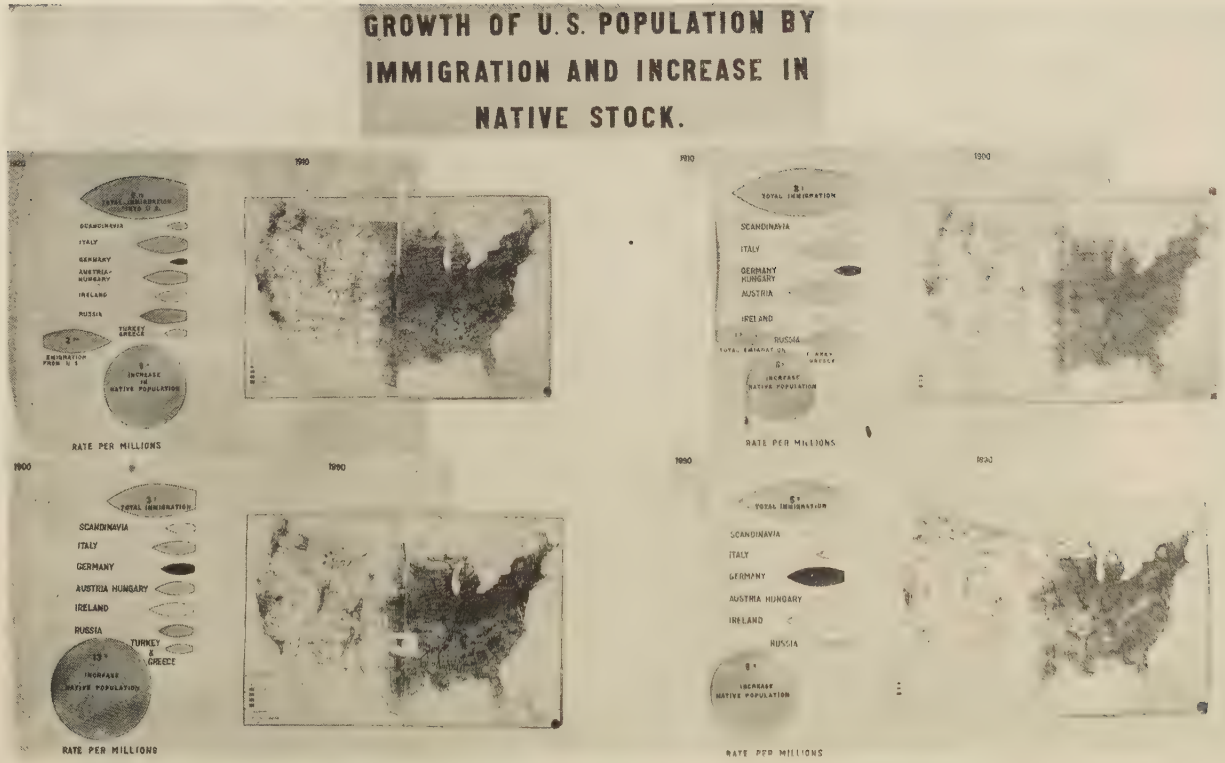


FIG. 14a. (AN EXTENSION OF PLATE 14)

PLATE 14. GROWTH OF UNITED STATES POPULATION BY IMMIGRATION AND BY INCREASE IN NATIVE STOCK

Begin to read at the right hand, bottom. The maps show the gradual filling up of the country. The circles indicate relative increase in native population. To the same scale are drawn boat-shaped figures giving the relative total immigration and immigration from each country during the decade. Eugenics Record Office

PLATE 15. IMMIGRATION INTO THE UNITED STATES FROM DIFFERENT COUNTRIES

From Report of the Commissioner of Immigration

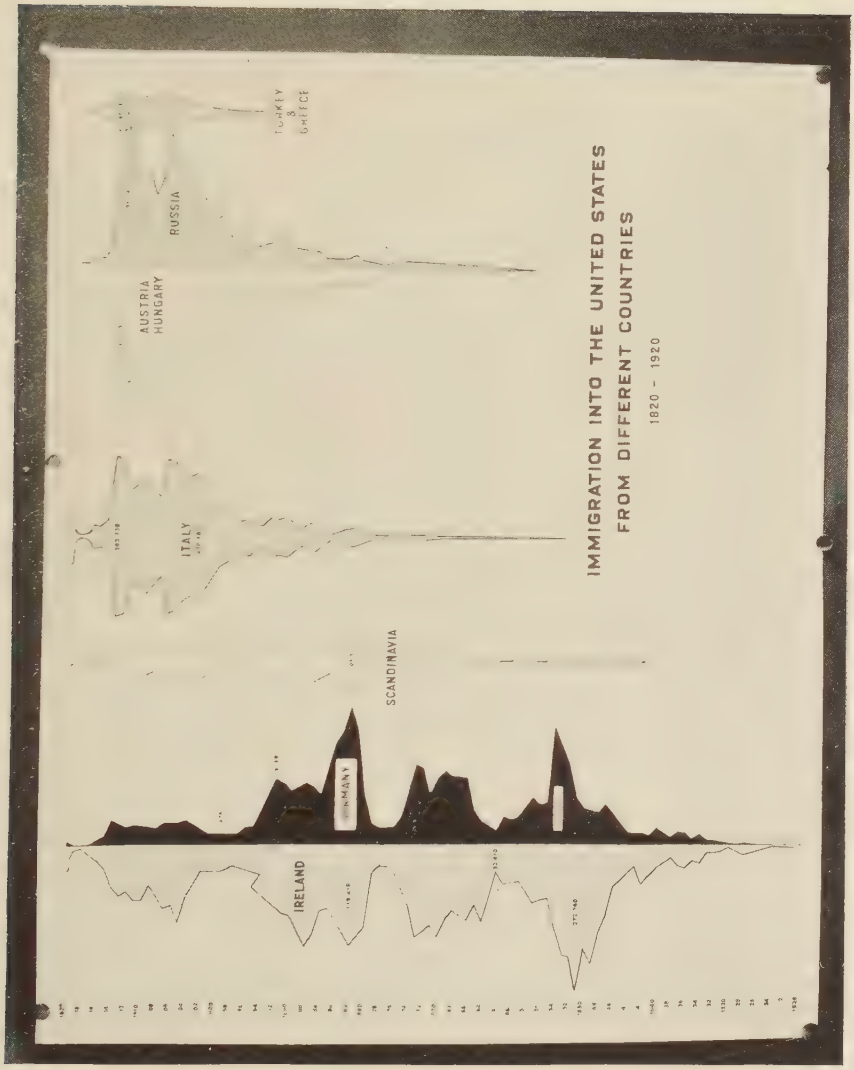

IMMIGRATION INTO THE UNITED STATES
FROM DIFFERENT COUNTRIES
1820 - 1920
TURKEY & GREECE
RUSSIA
AUSTRIA HUNGARY
ITALY
SCANDINAVIA
GERMANY
IRELAND

PLATE 16. INFANT MORTALITY IN UNITED STATES BY NATIONALITY OF MOTHER

Infant mortality in registration area of United States by country birth of mother; also by total registration area and total negro population. From Bureau of the Census

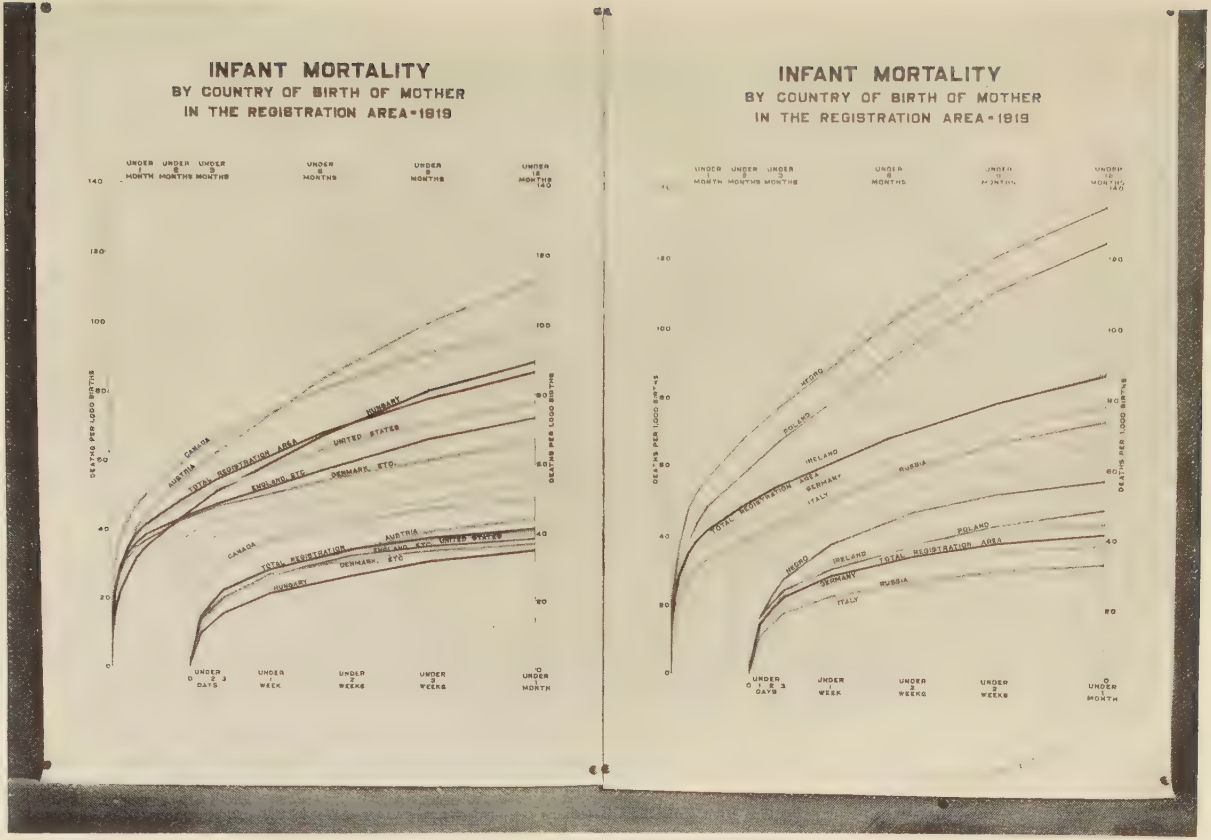
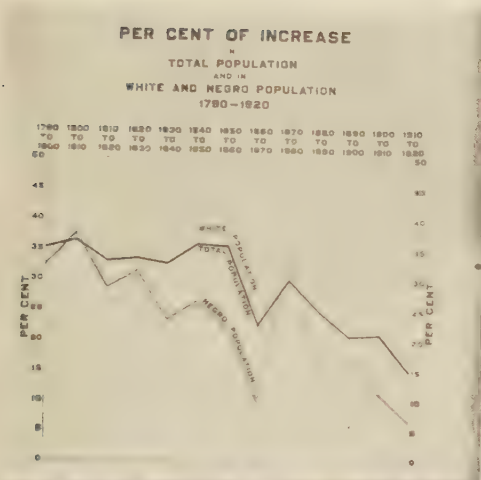
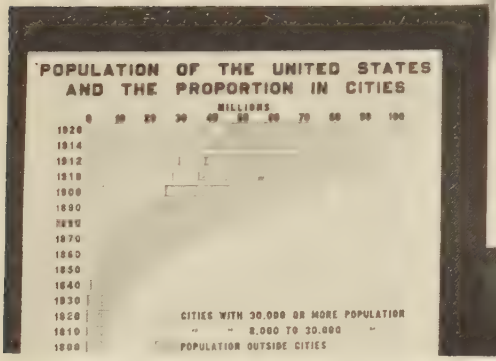

INFANT MORTALITY
BY COUNTRY OF BIRTH OF MOTHER
IN THE REGISTRATION AREA - 1919
UNDER 1 MONTH
UNDER 3 MONTHS
UNDER 6 MONTHS
UNDER 9 MONTHS
UNDER 12 MONTHS
UNDER 15 MONTHS
DEATHS PER 1,000 BIRTHS
CANADA
AUSTRIA
TOTAL REGISTRATION AREA
HUNGARY
UNITED STATES
ENGLAND ETC.
DENMARK, ETC.
UNDER 0 1 2 3 DAYS
UNDER 1 WEEK
UNDER 2 WEEKS
UNDER 3 WEEKS
UNDER 1 MONTH
INFANT MORTALITY
BY COUNTRY OF BIRTH OF MOTHER
IN THE REGISTRATION AREA - 1919
NEGRO
POLAND
IRELAND
GERMANY
ITALY
RUSSIA
TOTAL REGISTRATION AREA

PLATE 17. INCREASE IN UNITED STATES OF WHITES AND NEGROES, BOTH IN TOTAL AND INSANE POPULATION. ALSO GROWTH OF URBAN POPULATION

Three diagrams: (1) The percentage increase in the total white population and in the white and negro population, separately, 1790–1920. (2) Proportion of population insane in hospitals, for Northern and Southern States and for whites and negroes separately. (3) Growth of urban population of the United States. Bureau of the Census


PER CENT OF INCREASE
IN
TOTAL POPULATION
AND IN
WHITE AND NEGRO POPULATION
1790—1920
PER CENT
WHITE POPULATION
TOTAL POPULATION
NEGRO POPULATION


POPULATION OF THE UNITED STATES
AND THE PROPORTION IN CITIES
MILLIONS
CITIES WITH 30,000 OR MORE POPULATION
" " 8,000 TO 30,000 "
POPULATION OUTSIDE CITIES

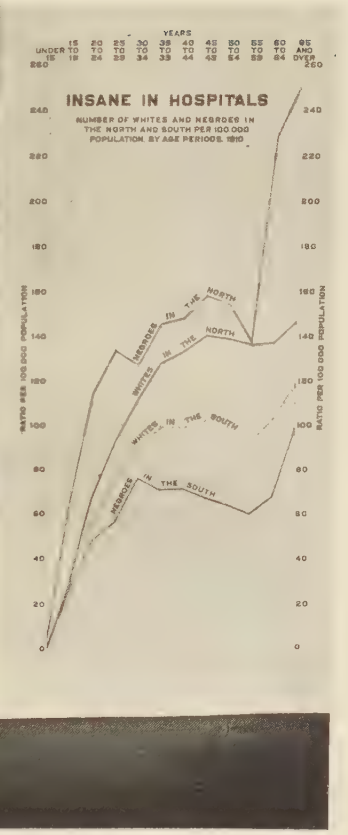
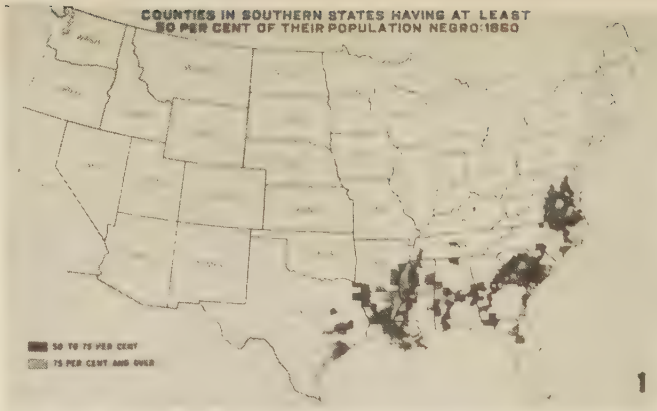
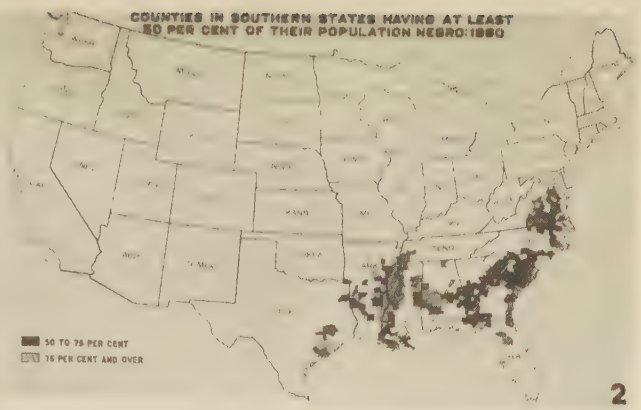

YEARS
INSANE IN HOSPITALS
NUMBER OF WHITES AND NEGROES IN
THE NORTH AND SOUTH PER 100,000
POPULATION, BY AGE PERIODS, 1910
RATIO PER 100,000 POPULATION
NEGROES IN THE NORTH
WHITES IN THE NORTH
WHITES IN THE SOUTH
NEGROES IN THE SOUTH

PLATE 18. FLUCTUATION IN DISTRIBUTION OF COUNTIES IN THE UNITED STATES WITH AT LEAST 50 PER CENT NEGRO, 1860–1920

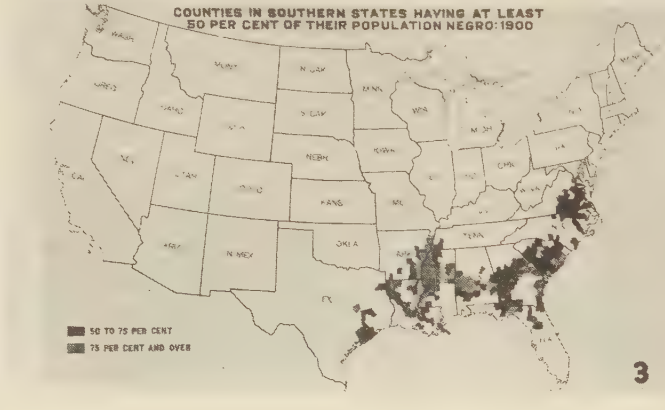
From Tuskegee Institute. Monroe N. Work


COUNTIES IN SOUTHERN STATES HAVING AT LEAST
50 PER CENT OF THEIR POPULATION NEGRO: 1860
50 TO 75 PER CENT
75 PER CENT AND OVER

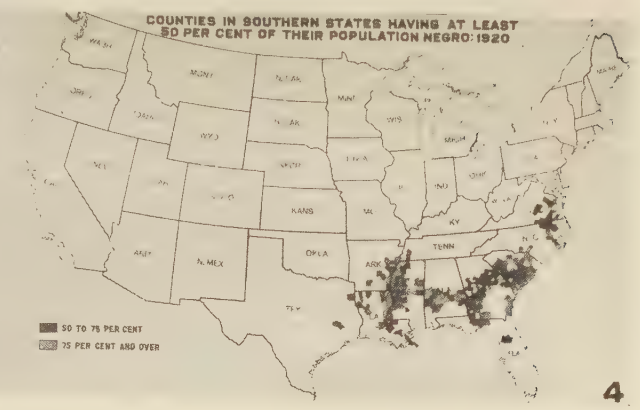
1


COUNTIES IN SOUTHERN STATES HAVING AT LEAST
50 PER CENT OF THEIR POPULATION NEGRO: 1880
50 TO 75 PER CENT
75 PER CENT AND OVER

2


COUNTIES IN SOUTHERN STATES HAVING AT LEAST
50 PER CENT OF THEIR POPULATION NEGRO: 1900
50 TO 75 PER CENT
75 PER CENT AND OVER

3


COUNTIES IN SOUTHERN STATES HAVING AT LEAST
50 PER CENT OF THEIR POPULATION NEGRO: 1920
50 TO 75 PER CENT
75 PER CENT AND OVER

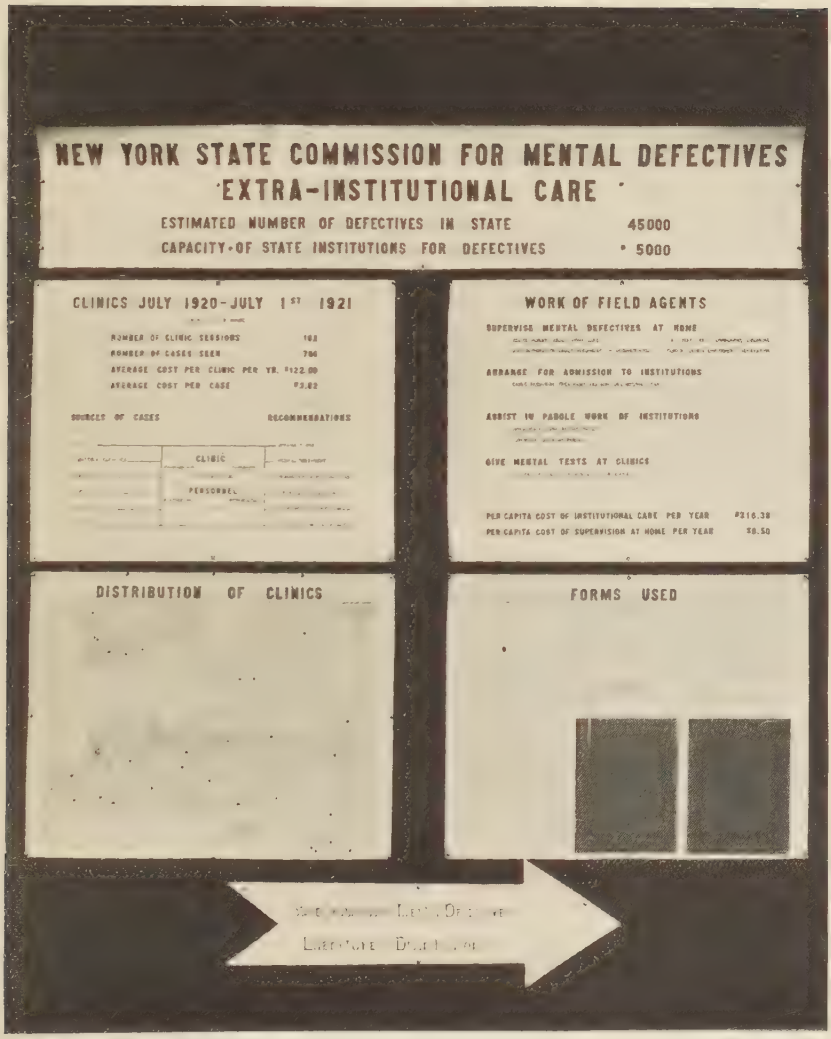
4

PLATE 19. EUGENICAL STERILIZATION IN THE UNITED STATES

Exhibited by H. Laughlin

EUGENICAL STERILIZATION LEGISLATION

Plate 20. New York State Commission for Mental Defectives, and Its Extra-Institutional Care


NEW YORK STATE COMMISSION FOR MENTAL DEFECTIVES
EXTRA-INSTITUTIONAL CARE
ESTIMATED NUMBER OF DEFECTIVES IN STATE 45000
CAPACITY OF STATE INSTITUTIONS FOR DEFECTIVES 5000
CLINICS JULY 1920-JULY 1ST 1921
NUMBER OF CLINIC SESSIONS 103
NUMBER OF CASES SEEN 706
AVERAGE COST PER CLINIC PER YR. $122.00
AVERAGE COST PER CASE $3.62
SOURCES OF CASES
RECOMMENDATIONS
CLINIC
PERSONNEL
WORK OF FIELD AGENTS
SUPERVISE MENTAL DEFECTIVES AT HOME
ARRANGE FOR ADMISSION TO INSTITUTIONS
ASSIST IN PAROLE WORK OF INSTITUTIONS
GIVE MENTAL TESTS AT CLINICS
PER CAPITA COST OF INSTITUTIONAL CARE PER YEAR $216.38
PER CAPITA COST OF SUPERVISION AT HOME PER YEAR $8.50
DISTRIBUTION OF CLINICS
FORMS USED